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ROCKY MOUNTAIN ARSENAL

SOUTH PLANTS CERCLA PRETREATMENT SYSTEM OPERATIONAL

ASSESSMENT REPORT

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FINAL REPORT

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TECHNICAL OPERATIONS DIVISION
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PREFACE

This study was conducted as part of a cooperative effort by personnel from the Technical Operations Division (TOD) of the Program Manager for Rocky Mountain Arsenal (PMRMA) and the U.S. Army Engineer Waterways Experiment Station (WES). Funding for participation by WES was provided by the PMRMA via Intra-Army Order No. 0850. Project Management was provided by Messrs. David W. Strong, TOD, and Norman R. Francingues, WES Environmental Laboratory (EL).

The contributing authors to this report were Messrs. Jack H. Dildine, Douglas W. Thompson, Norman R. Francingues (WES-EL), and Tom Brooks (TOD).

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SOUTH PLANTS CERCLA PRETREATMENT SYSTEM
OPERATIONAL ASSESSMENT
FY 88-89 ACTIVITIES

PART I: INTRODUCTION

Background

1. The South Plants CERCLA Pretreatment System Operational Assessment described herein has been prepared to document and evaluate the treatment process performance related to the system operations. This report covers the system startup and operating periods including August and September of FY88 and all of FY89. Some data was only available for FY89.

Treatment System Description

2. The South Plants CERCLA Pretreatment System (CPS*) was initially constructed in 1982 primarily as a means of treating waste from the analytical and bioassay laboratories at Rocky Mountain Arsenal (RMA). Over the years, the CPS was increasingly used for the treatment of other wastewaters generated on the Arsenal from various field activities. The system was upgraded in 1988 to include an air stripper for the removal of volatile organics.

3. During the study period, the CPS consisted of a 170,000 gallon storage tank, a 24-inch diameter activated carbon column, an 8-inch diameter activated alumina column, a small in-line cartridge filter, and a small air stripping unit (see Figure 1). The system was designed to operate at 10 gallons per minute (gpm). However, problems associated with the carbon column and alumina column, including plugging and carryover of carbon and alumina, have reduced the actual flow through this part of the system to about 1.5 to 2.0 gpm. The air stripper has successfully achieved an operational rate of 10 gpm.

4. In operation, the wastewater is fed from the 170,000 gallon storage tank through the filter to the activated carbon and activated alumina columns.

* Thompson et al. 1989, "CERCLA Wastewater Treatment System needs assessment and Processes Treatability Study," U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS RIC #90009R03.

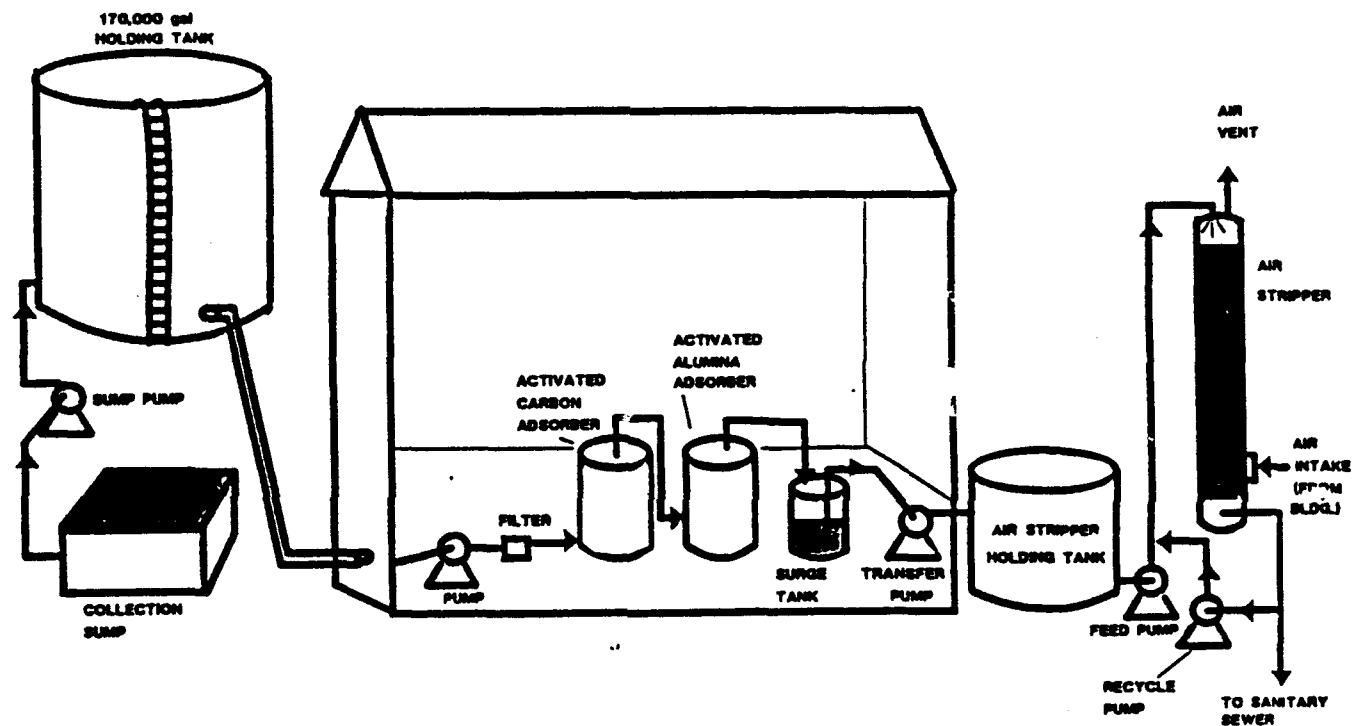


Figure 1. Flow diagram of South Plants CERCLA Pretreatment System at RMA.

The treated water then flowed to a 10,000 gallon storage tank which is part of the air stripping system. When the small storage tank was full, the air stripper was started and run until the 10,000 gallon tank was emptied. The treated water was discharged to the sanitary sewer. The system was operated during normal working hours, five days a week. The carbon column and air stripper remove organic contaminants, while the alumina column removes fluoride. The air stripper was brought on line in October 1988, and a series of start-up and evaluation runs were made using the Modified System. The system was considered fully operational in October 1988.

5. During the study period, the CPS treated wastewater generated from the RMA laboratory, decontamination pad operations, remedial investigation studies, comprehensive monitoring program, and interim response actions. In operation, the wastewater from the laboratory discharged into a sump located outside the northwest corner of the laboratory building. From the sump, the water was pumped by means of an underground pipeline to the 170,000 gallon, above-ground storage tank located adjacent to the CPS building. Other wastewaters were transported from their point of generation by tanker trucks and discharged into the sump. The storage tank was steam heated to facilitate year-round use.

Report Objectives

6. Report objectives include:

- a. To assess the effectiveness of the South Plants in treating liquid wastes that were generated from the various activities at RMA.
- b. To document system operating parameters.
- c. To identify and document system improvements, field studies, and facility alterations conducted during the latter part of FY88 and all of FY89.

Approach

7. The approach to developing this study incorporates direction of the Technical Operations Division (TOD) at RMA. TOD established and provided the reporting framework and objectives, the data base and general technical guidance. The U.S. Army Engineer Waterways Experiment Station (WES), Vicksburg, Mississippi, provided specialized environmental engineering assessments.

PART II: PLANT OPERATIONS MONITORING

8. The treatment plant monitoring program included collection of data on flow rates through the system and on the quality of the water entering the plant, after carbon/alumina treatment, and leaving the plant. The flow quantities were obtained from a totalizing flow meter located on the effluent line from the carbon/alumina treatment subsystem. The meter was read and the values recorded on a daily basis. Monthly flow quantities were calculated from the daily reports.

9. Samples were collected monthly from sampling ports located in the influent line, in the line between the carbon/alumina treatment subsystem and the air stripper storage tank, and in the effluent line from the air stripper. Sampling was generally conducted during the last week in each month. No samples were collected during November of 1988 because the system was down for repair and due to process treatability testing being conducted at the plant site. Only effluent samples from the air stripper were analyzed in October of 1988. The data collected were used to determine change-out requirements for the carbon and alumina adsorbers.

10. Periodically, samples were collected and subjected to a GC/MS scan to determine if any contaminants other than those routinely analyzed for were present. The samples were collected from the same sampling ports used for the routine monthly sampling program. Samples were collected in October and December of 1988, and January, February, March, April, May, June, July, August and September of 1989.

11. All water samples were collected in previously cleaned, labeled glass containers, sealed, and transported to the appropriate analytical laboratory at RMA or their contractor for analysis. The analytes for which the plant water samples were analyzed for during the study period are detailed in Table 1 along with methods and the most current certified reporting limits (CRL's). All analyses were performed using standard methods. The analytical data were entered into the data base by laboratory personnel, subjected to a quality control routine, validated, and placed into the PMRMA data base by the RIC. The process system flow data were entered into the PMRMA data base by the RIC. Data sets were prepared for use in developing the tables and figures used in this report by the RIC and supporting contractors. Copies of monthly analytical data and GC/MS scan data are presented in Appendices A and B,

respectively, of this report. Statistical summary sheets for each analyte analyzed for in FY89 are presented in Appendix A.

Table 1
Analyte Methods and CRL's for
South Plants CERCLA Pretreatment System

<u>METHOD NUMBER</u>	<u>METHOD NAME</u>	<u>ANALYTE</u>	<u>CRL ($\mu\text{g}/\text{L}$)</u>
AAA8	ORGANOSULFURS/WATER/GCFP	BTZ	5.000000
		CPMS	5.690000
		CPMSO	11.500000
		CPMSO2	7.460000
		DITH	1.340000
		DMDS	0.550000
		OXAT	2.380000
AT8	ORGANOPHOSPHOR/WATER/GCFP	DIMP	0.392000
		DMMP	0.188000
AV8	AROMATICS/WATER/GCPID	13DMB	1.320000
		C6H6	1.050000
		ETC6H5	1.370000
		MEC6H5	1.470000
		XYLEN	1.360000
AW8A	ORGANOPHOSPHOR/WATER/GCFP	DIMP	0.650000
AX8	METALS/WATER/GFAA	AS	2.350000
AY8	PESTICIDES/WATER/GCEC	DBCP	0.195000
CC8	METALS/WATER/CVAA	HG	0.100000
GG8	METALS/WATER/ICP	CA	500.000000
		CD	8.400000
		CR	24.000000
		CU	26.000000
		K	250.000000
		MG	500.000000
		NA	940.000000
		ZN	22.000000
HH8A	ANIONS/WATER/IONCHROM	CL	720.000000
		F	482.000000
		SO4	251.000000
KK8	PESTICIDES/WATER/GCEC	ALDRN	0.050000
		CL6CP	0.048000
		CLDAN	0.095000
		DLDRN	0.050000
		ENDRN	0.050000
		ISODR	0.051000
		PPDDE	0.054000
		PPDDT	0.049000

(Continued)

Table 1 (Continued)

<u>METHOD NUMBER</u>	<u>METHOD NAME</u>	<u>ANALYTE</u>	<u>CRL ($\mu\text{g}/\ell$)</u>
LL8	ANIONS/WATER/TECHNICON	NIT	10.000000
N8	HALOCARBONS/WATER/GCCON	111TCE	0.760000
		112TCE	0.780000
		11DCE	1.700000
		11DCLE	0.730000
		12DCE	0.760000
		12DCLE	1.100000
		CCL4	0.990000
		CH2CL2	7.400000
		CHCL3	0.500000
		CLC6H5	0.820000
		TCLEE	0.750000
		TRCLE	0.560000
P8	VOLATILES/WATER/GCFID	BCHPD	5.900000
		DCPD	5.000000
		MIBK	4.900000
SS12	METALS/WATER/ICP	CA	105.000000
		CD	6.780000
		CR	16.800000
		CU	18.800000
		K	1240.000000
		MG	135.000000
		NA	279.000000
		PB	43.400000
		ZN	18.000000
TF20	CYANIDE/WATER/TECHNICON	CYN	5.000000
TT09	ANIONS/WATER/IONCHROM	CL	278.000000
		F	153.000000
		SO4	175.000000
UH11	NP-PESTICIDES/WATER/GCEC	ATZ	4.030000
		DDVP	0.384000
		MLTHN	0.373000
		PRTHN	0.647000
		SUPONA	0.787000

PART III: SYSTEM OPERATIONS AND FACILITY ALTERATIONS

Operational Summary

12. A review of the daily records for the study period indicated that the CPS generally operated as scheduled with little down time. As previously discussed, the system was started up each morning and shut down each afternoon. The air stripper was operated periodically when the 10,000 gallon storage tank became full. This schedule allowed maintenance to be performed on the system each morning as required prior to start up. Every two to three months over the study period, the system was taken out of service for a day to replace the alumina or carbon or both.

13. The system went down several times in August and September, 1988, due to plugging of the flow meter with carbon and alumina. This problem was resolved during FY89 by upgrading the filter system and routinely cleaning the filter screens. The system was down in February, 1989, for a day due to a frozen pipe. Electrical problems, primarily fuses, resulted in the plant being down for a day in both July and August, 1989.

14. A record of plant operations for the CPS is maintained by RMA plant operations personnel with major events documented on a daily basis. This daily record contains information on the operation, maintenance activities, and repairs of the treatment plant equipment. It also details other events such as plant downtime, equipment failure, and, filter, carbon, and alumina removal and replacement.

Facility Alterations

15. No major alterations were made to the CPS during FY89. Some minor work was done on upgrading the filter system to reduce plugging.

System Flow Quantities

16. The volume of water treated by the CPS is recorded on a daily basis. The monthly flow quantities recorded for FY89 are presented in Table 2 and graphed in Figure 2. During FY89, the volume of water treated ranged from a low of 15,540 gallons in May to a high of 70,400 gallons in June. The total volume of water treated in FY89 was 512,600 gallons. Monthly average flow

Table 2
Volume of Water Treated by South Plants
Treatment System During FY89

<u>FY89 Month</u>	<u>Volume Treated (Gals.)</u>
October	55,540
November	46,810
December	60,220
January	43,370
February	17,670
March	21,620
April	18,780
May	15,540
June	70,400
July	69,450
August	57,430
September	35,770
TOTAL	512,600

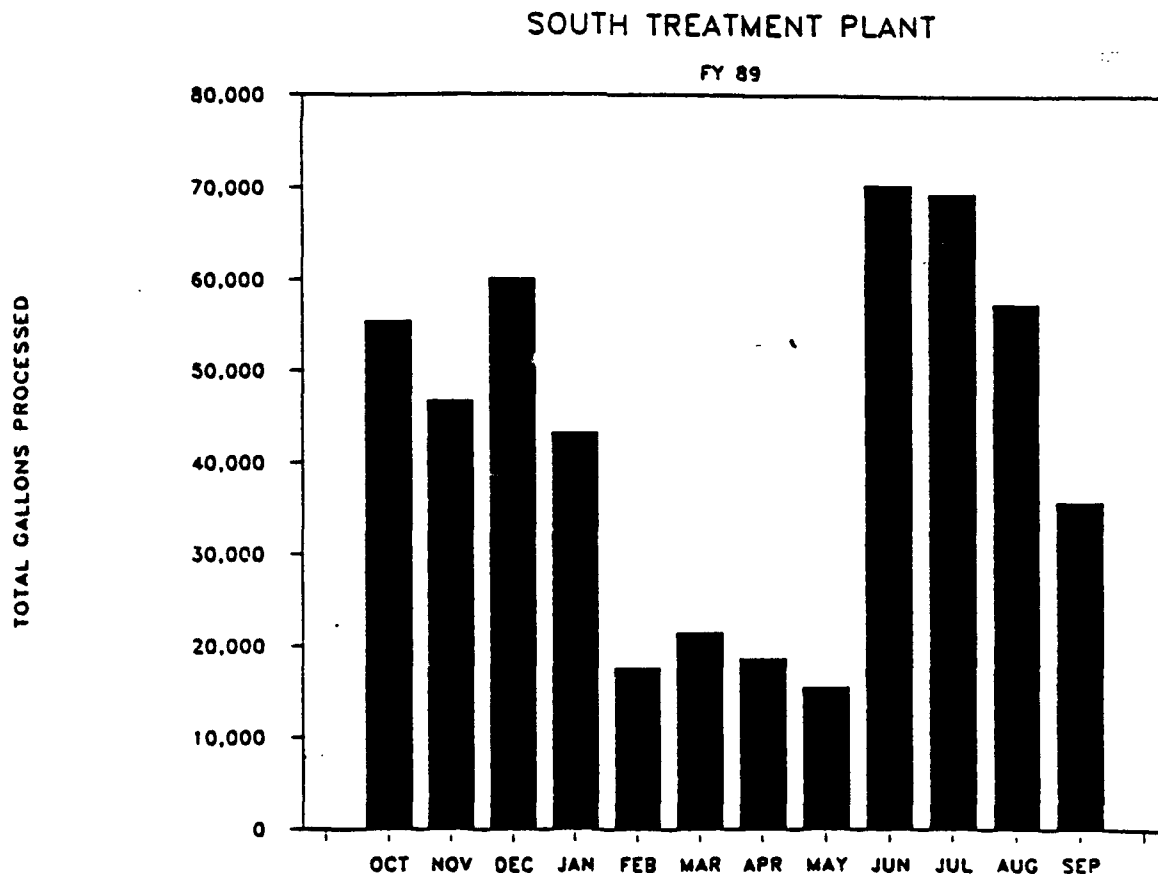


Figure 2. Monthly flow for FY89 through the South Plants Treatment System.

rates during FY89 ranges from 0.35 gpm in May to 1.53 gpm in June. The average flow rate for the year was 0.96 gpm.

System Water Quality

17. As previously discussed, the results of the analysis of the samples collected from the CPS are presented in Appendix A of this report. Statistical summaries of the chemical analyses for FY89 are also presented in Appendix A. The summaries include the analyte, the total number of samples analyzed, the certified reporting limit (CRL), the number of results greater than the CRL, the low value, the high value, and the mean. The CRL's for several of the analytes changed during the year indicating slight modifications in the analytical methods used.

18. Graphs of the concentrations of contaminants found above their respective CRL's in the system influent, carbon/alumina effluent, and air stripper effluent were prepared and are presented in Figures 3 through 37. No graphs were prepared for the majority of the inorganics analyzed for since the treatment system does not provide the mechanism for their removal. The analytical results for those inorganics are included in the data base provided by the PMRMA. Graphs were not prepared in those cases where the contaminant concentrations were below the CRL in all three samples for the whole study period. Each graph presents a plot of the contaminant concentrations over the reporting period. An average concentration for the reporting period was calculated for sets of data where 70 percent or more of the readings were above the CRL. When this criteria was met, values falling below the CRL were made equal to the CRL and included in the computation. These averages are represented by a line and the letters "AVG".

19. In reviewing the graphs and analytical data, it is important to remember that due to system configuration, there was a potential for a considerable lag time between the time that an aliquot of water entered the treatment system and when it left. The carbon/alumina treatment subsystem ran in a continuous mode while the air stripper ran in a batch mode. Influent to the stripper flowed from the 10,000-gallon storage tank which was filled by the effluent from the carbon/alumina treatment subsystem. This storage tank served to average the concentrations of contaminants passing through the carbon/alumina treatment subsystem. In addition, the influent to the SPTS was

not consistent with respect to specific contaminants and concentrations as are the influents to the other treatment systems at RMA. The SPTS received contaminated water from the RMA lab, decontamination pad, drum washing area, and other activities on the Arsenal. Thus, the characteristics of the influent could change daily depending on the nature of the wastes routed to the system.

20. As a result, the samples collected from the influent and effluent of the SPTS probably represented entirely different aliquots of water since the hydraulic retention time in the system could have been a number of days. Thus, if a "slug" of contamination entered the system, several days might have passed before that "slug" would have been seen in effluent if not removed by the system. These time delays could produce erratic sample results since all samples were collected on the same day. In order to eliminate this potential situation, the SPTS was operated so as to attempt to remove the contaminants to levels below their respective CRL's where possible.

1,1,1-Trichloroethane

21. The CRL for 1,1,1-trichloromethane (111TCE) was 0.76 ug/l as indicated in Figure 3. No concentrations of 1,1,1-trichloromethane above the CRL were found in any of the samples collected from the system influent or carbon/alumina effluent during the study period. A single sample from the air stripper effluent collected in January had a concentration just slightly above the CRL at 1.4 ug/l. Thus, 1,1,1-trichloromethane was not a contaminant of much significance for the CPS during the study period.

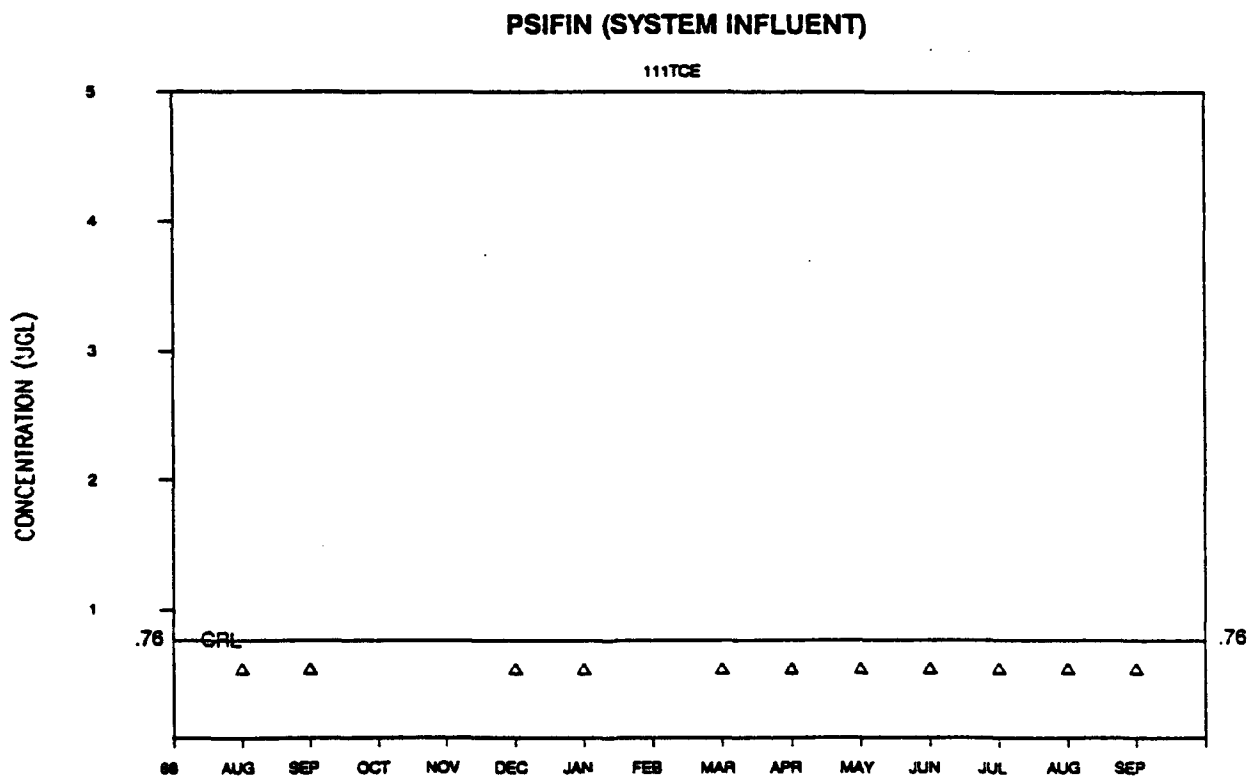
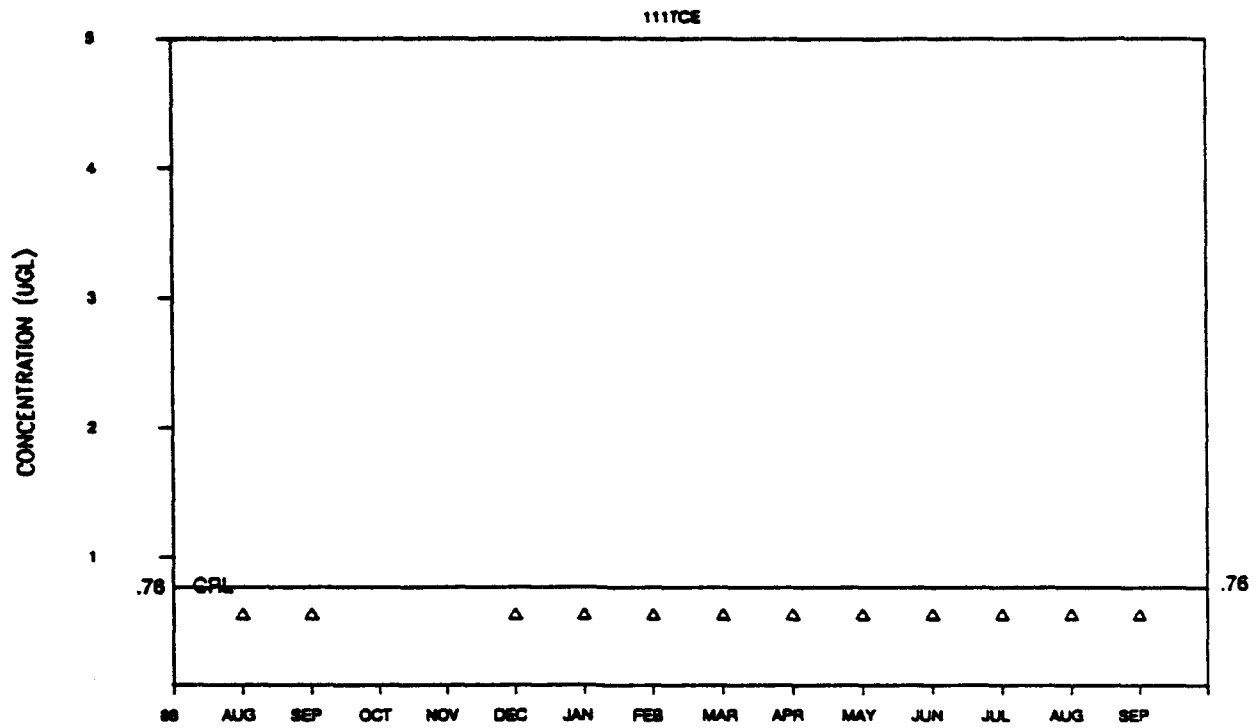


Figure 3. 1,1,1-Trichloromethane Concentrations (Continued)

PSAAEF (CARBON/ALUMINA EFFLUENT)



PSASEF (AIR STRIPPER EFFLUENT)

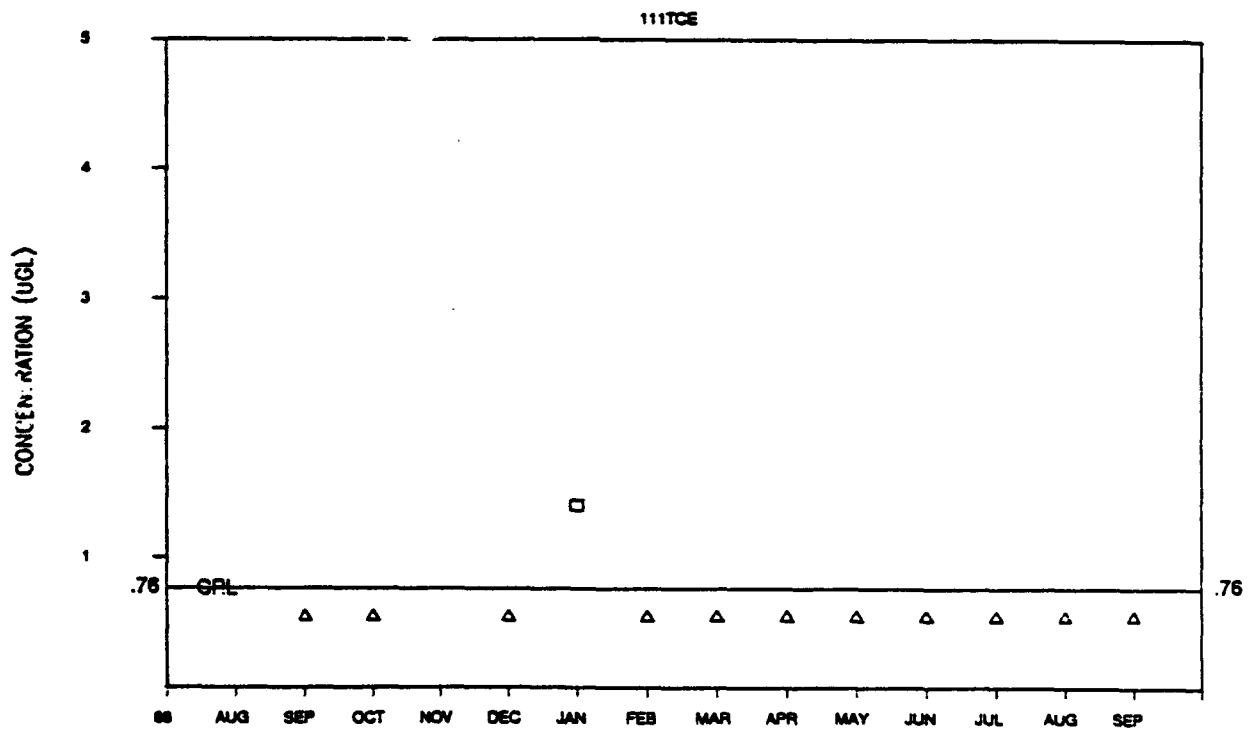


Figure 3. 1,1,1-Trichloroethane (Concluded)

Aldrin

22. The CRL for aldrin (ALDRN) was 0.05 ug/l as indicated in Figure 4. Numerous samples collected from the system influent were found to contain aldrin above the CRL. The maximum concentration found was approximately 0.5 ug/l. Three samples collected from the carbon/alumina effluent were found to contain aldrin above the CRL including those collected in September and December of 1988, and June of 1989. The maximum concentration found was approximately 0.28 ug/l in the June sample. Only one sample, collected in December, from the air stripper effluent had a concentration of aldrin above the CRL. This concentration was only slightly above the CRL. This data indicates that small concentrations of aldrin were present in some of the wastewater routed to the CPS and that the treatment system effectively removed it.

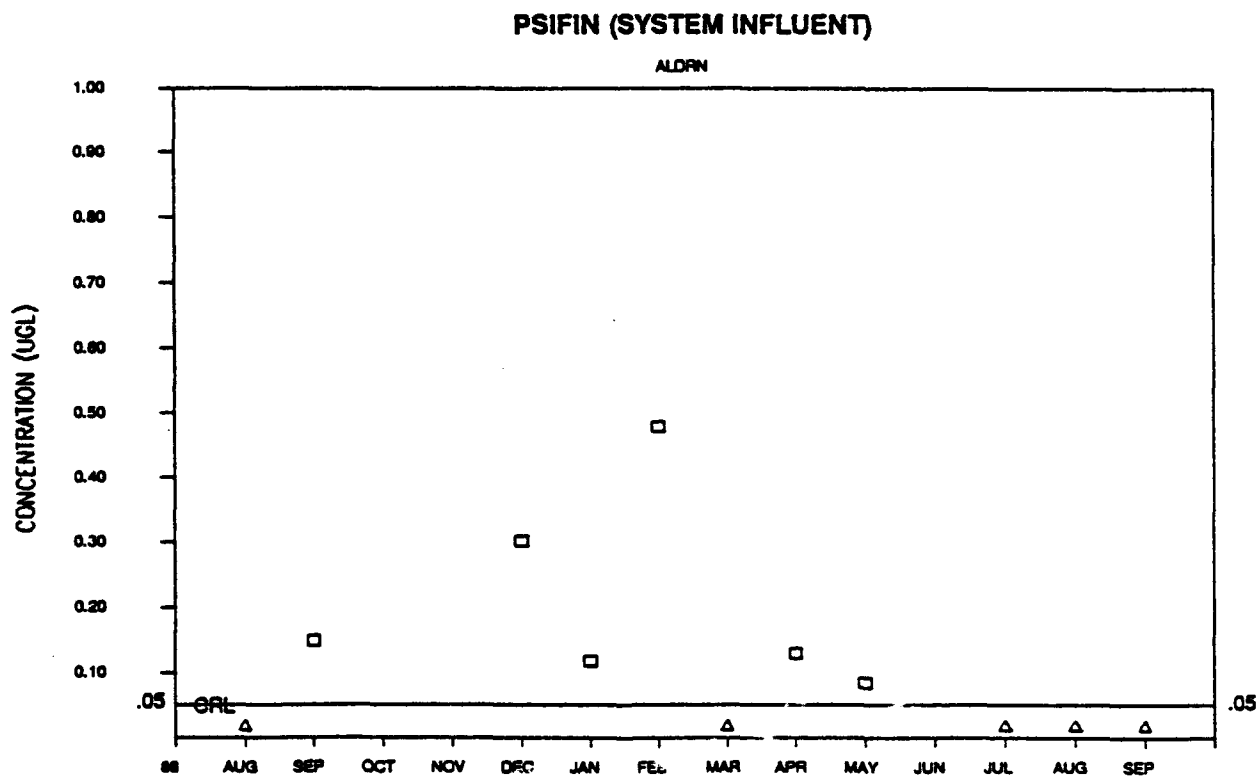
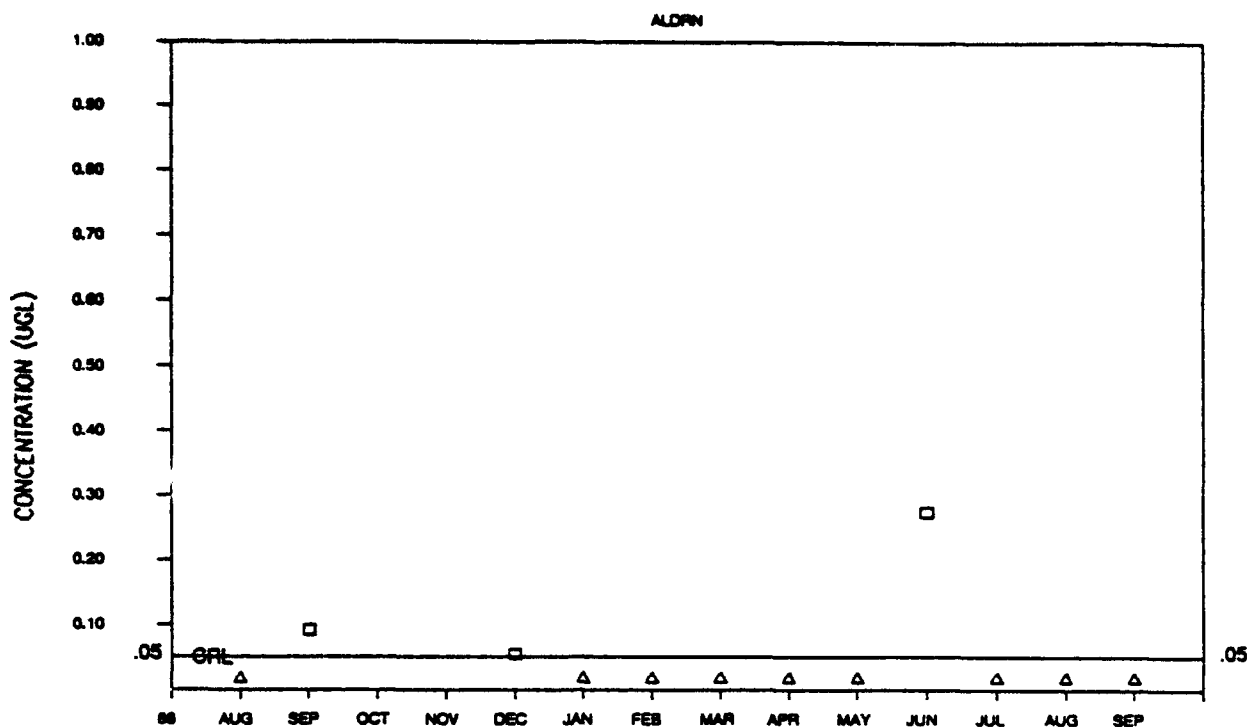


Figure 4. Aldrin Concentrations (Continued)

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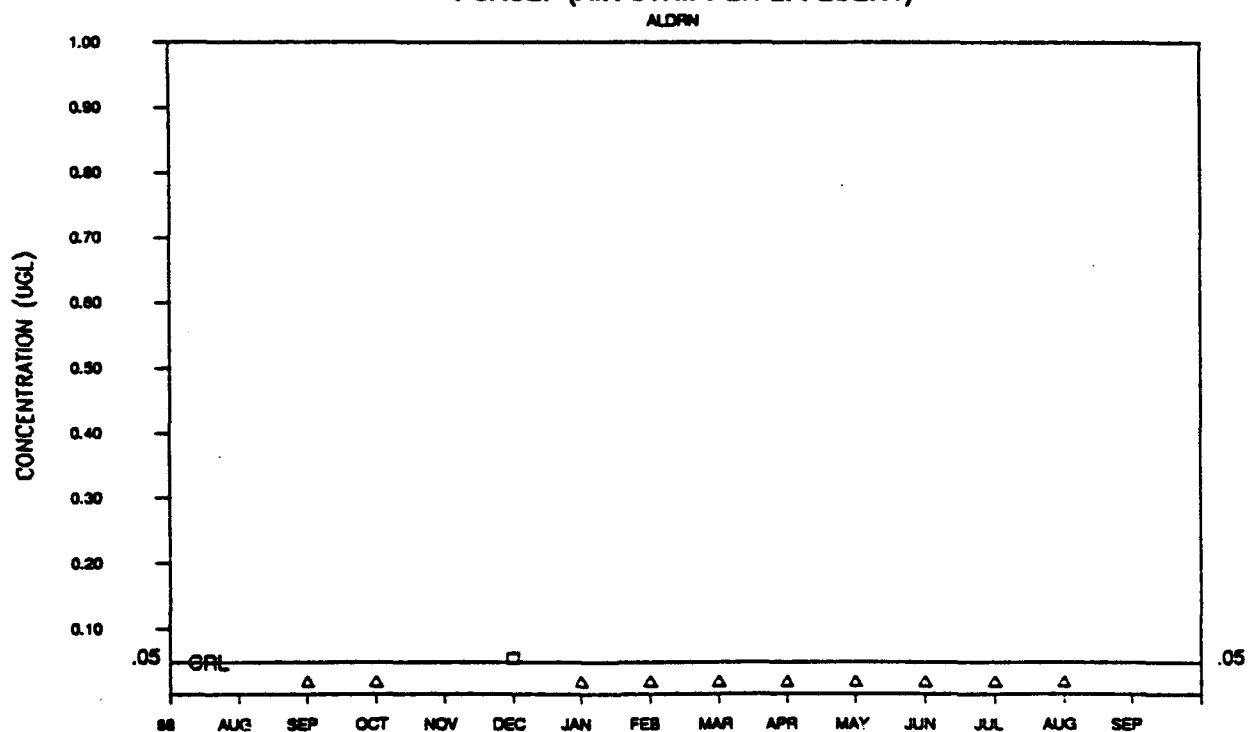


Figure 4. Aldrin (Concluded)

Atrazine

23. The CRL for atrazine (ATZ) was 4.03 ug/l as indicated in Figure 5. A majority of the samples collected from the system influent were found to contain atrazine above the CRL. The maximum concentration found was approximately 12 ug/l. The average concentration in the system influent over the study period was 7.12 ug/l. None of the samples collected from the carbon/alumina or air stripper effluents contained atrazine concentrations above the CRL. This data indicates that atrazine was a common contaminant in the CPS influent during the study period and that the treatment system effectively removed it.

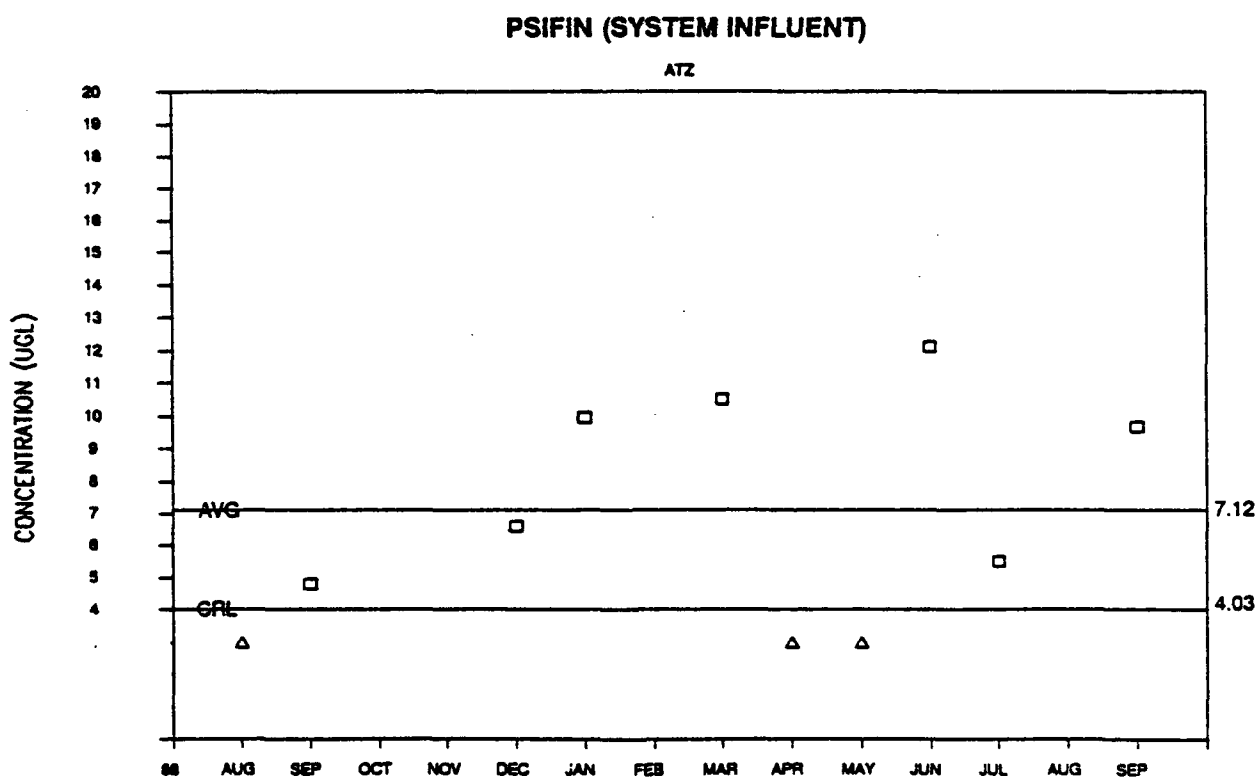
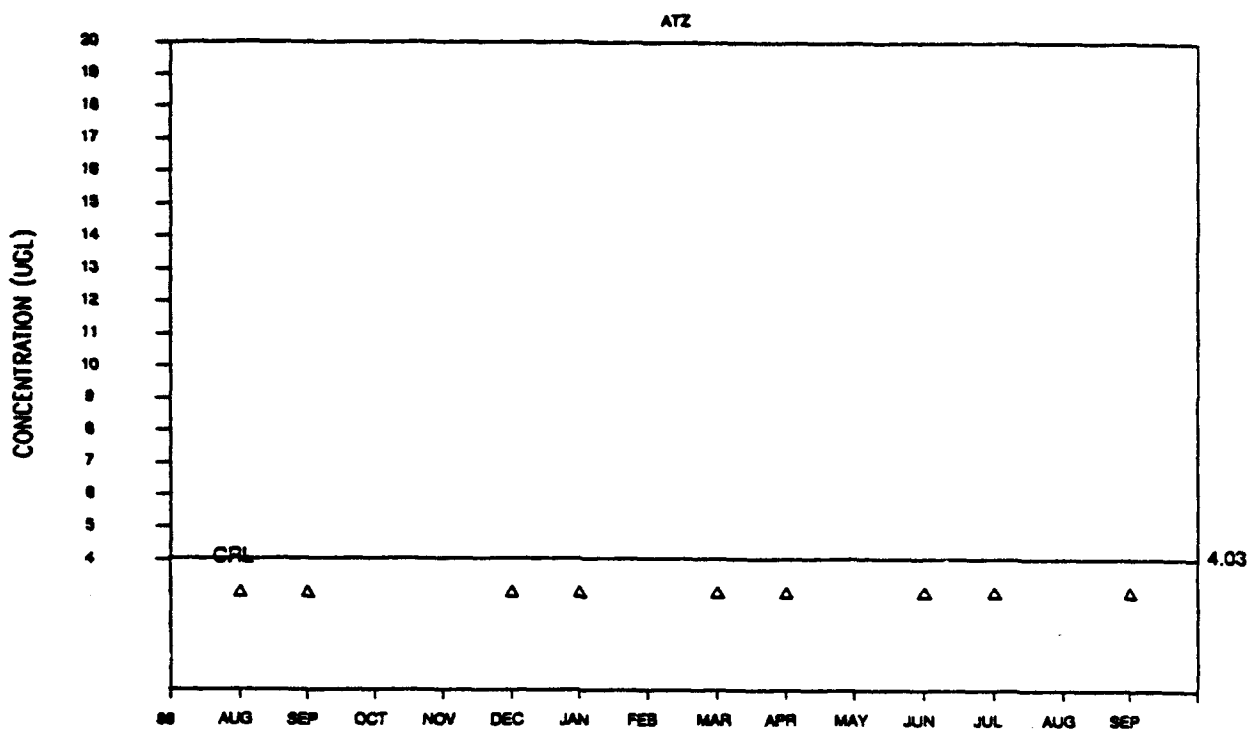


Figure 5. Atrazine Concentrations (Continued)

PSAAEF (CARBON/ALUMINA EFFLUENT)



PSASEF (AIR STRIPPER EFFLUENT)

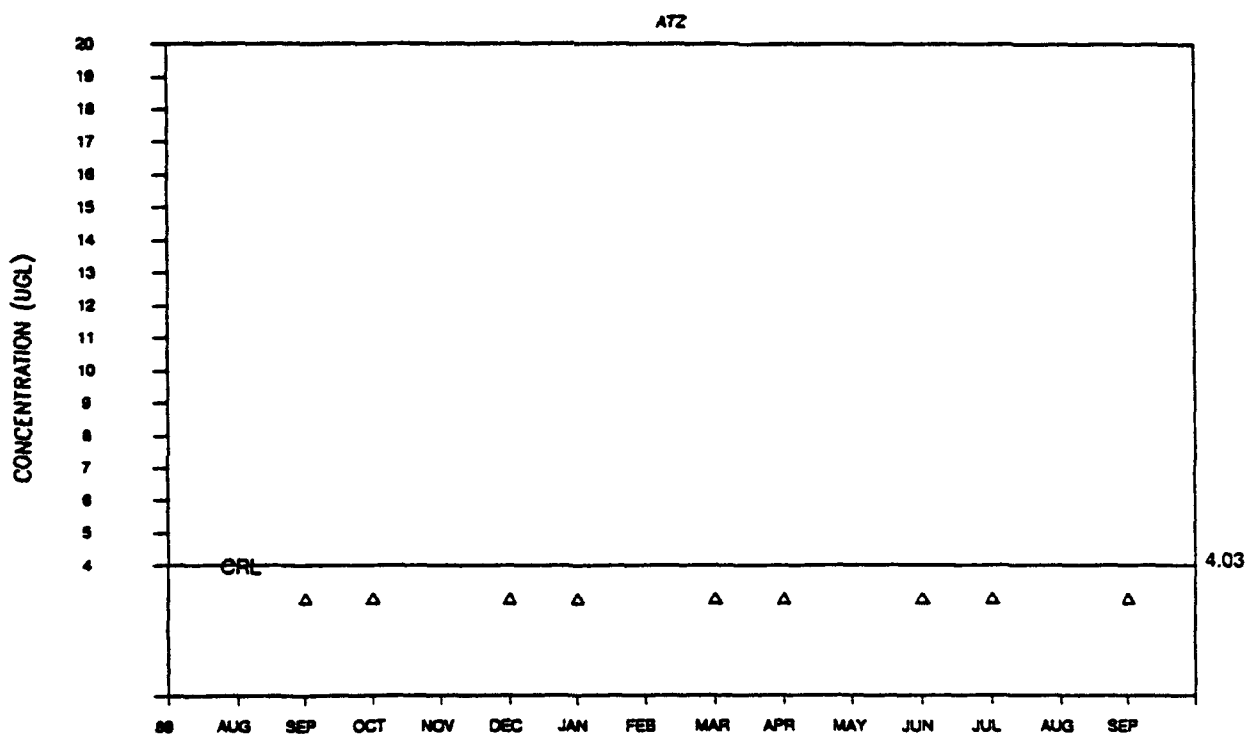


Figure 5. Atrazine (Concluded)

Benzothiazole

24. As indicated in Figure 6, the CRL for benzothiazole (BTZ) was 5.0 ug/l. Three samples collected from the system influent in August and September, 1988, and June, 1989, were found to contain benzothiazole above the CRL. The maximum concentration found was approximately 9 ug/l. One sample collected from the carbon/alumina effluent in February 1989, contained benzothiazole at a concentration just slightly above the CRL. No samples collected from the air stripper effluent during the study period contained benzothiazole in excess of the CRL. The benzothiazole results indicate that small concentrations of the contaminant were present in the influent to the CPS and that the system effectively removed it.

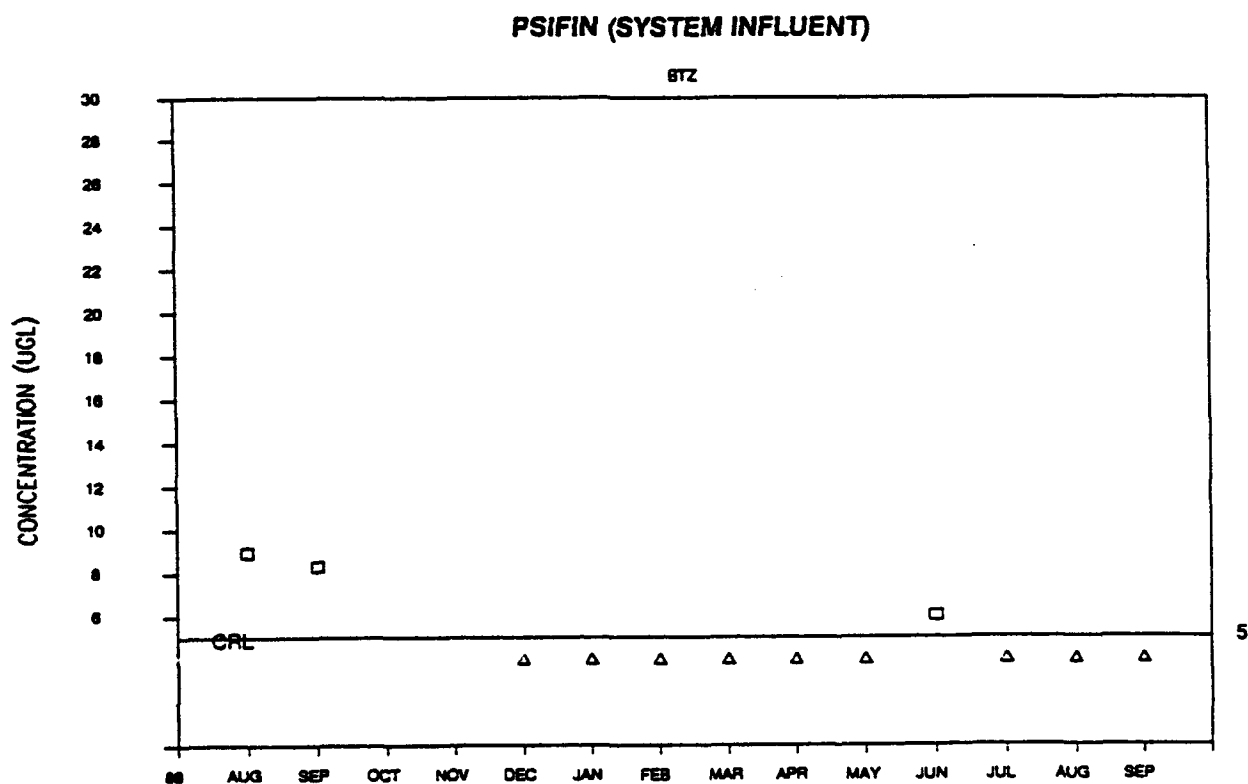
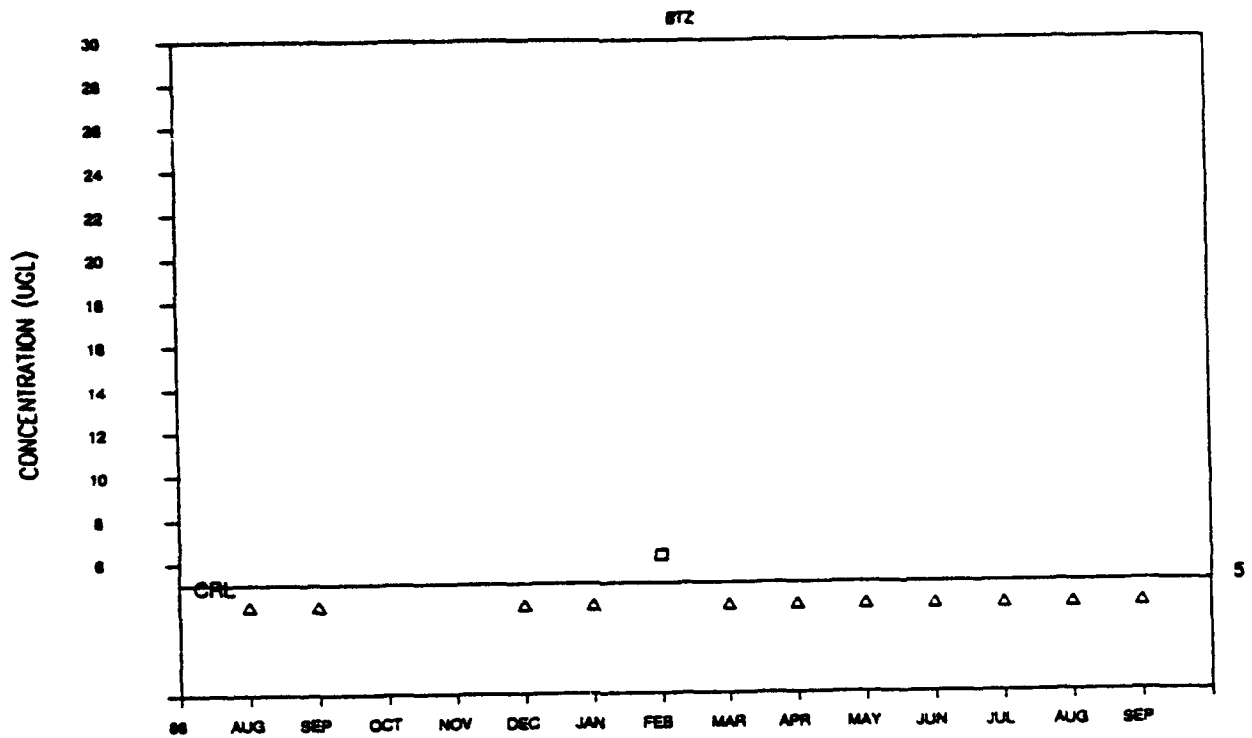


Figure 6. Benzothiazole Concentration (Continued)

PSAAEF (CARBON/ALUMINA EFFLUENT)



PSASEF (AIR STRIPPER EFFLUENT)

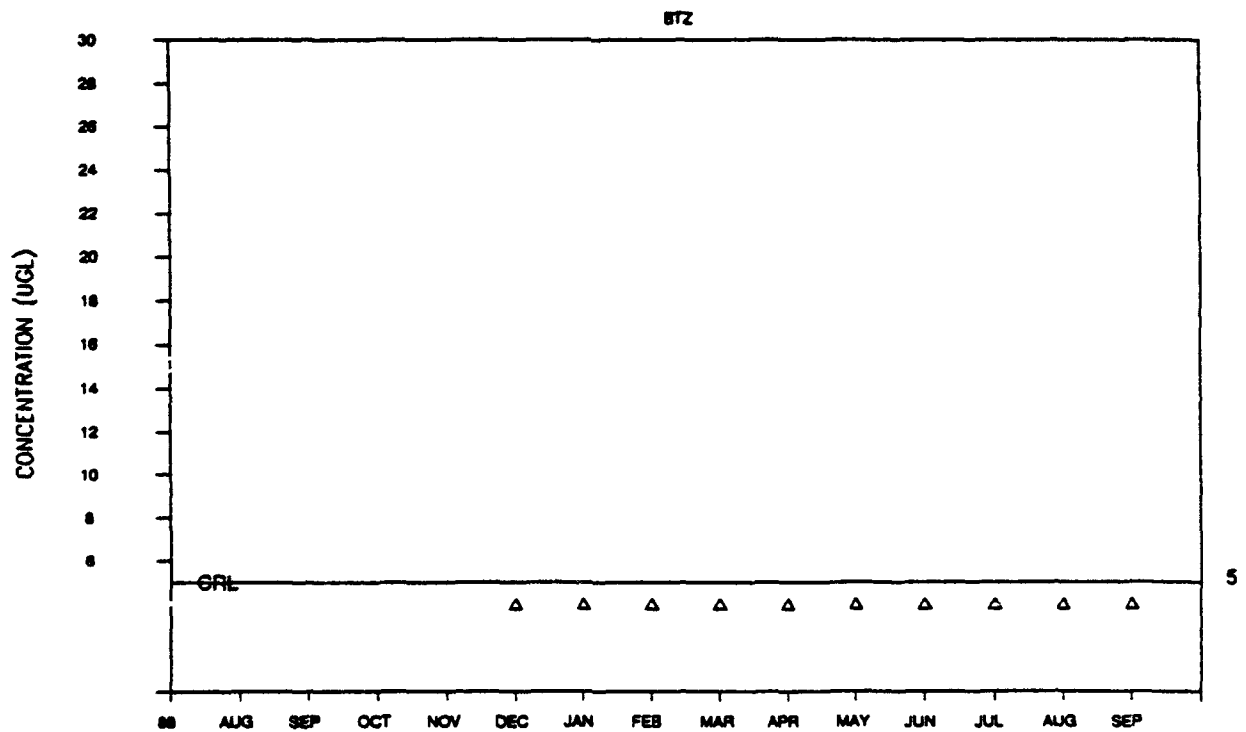


Figure 6. Benzothiazole (Concluded)

Benzene

25. The CRL for benzene (C6H6) was 1.05 ug/l as indicated in Figure 7. Half of the samples collected from the system influent in FY89, contained benzene in concentrations above the CRL. The maximum concentration found was approximately 18 ug/l. None of the samples collected from the carbon/alumina or air stripper effluents contained benzene above the CRL. In summary, the small concentrations of benzene found in the system influent were effectively removed by the CPS.

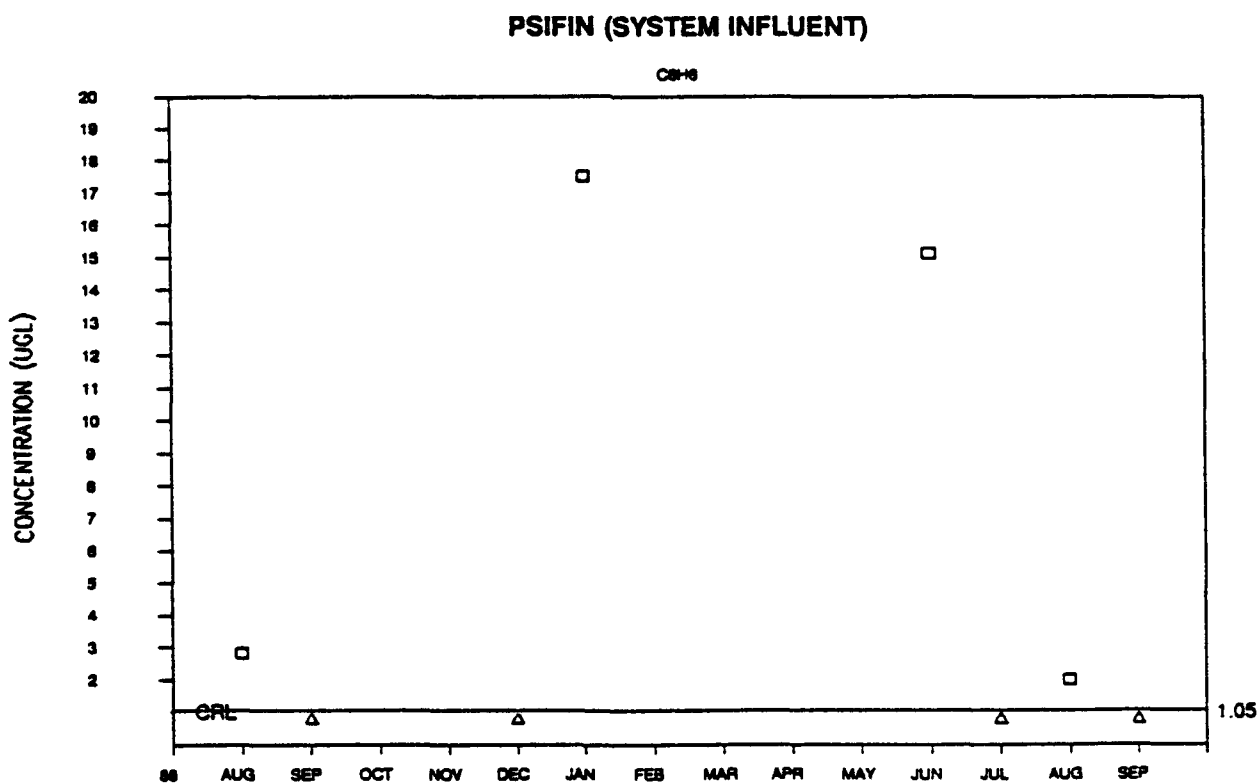


Figure 7. Benzene Concentrations (Continued)

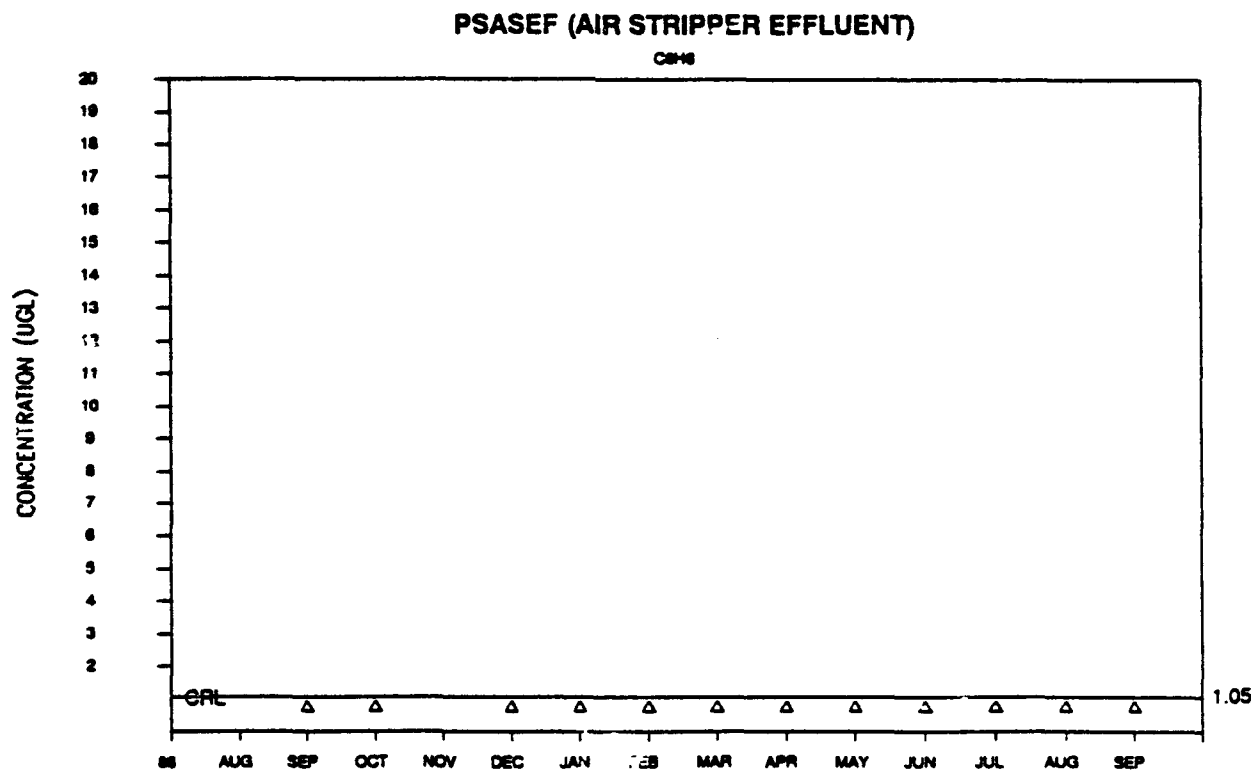
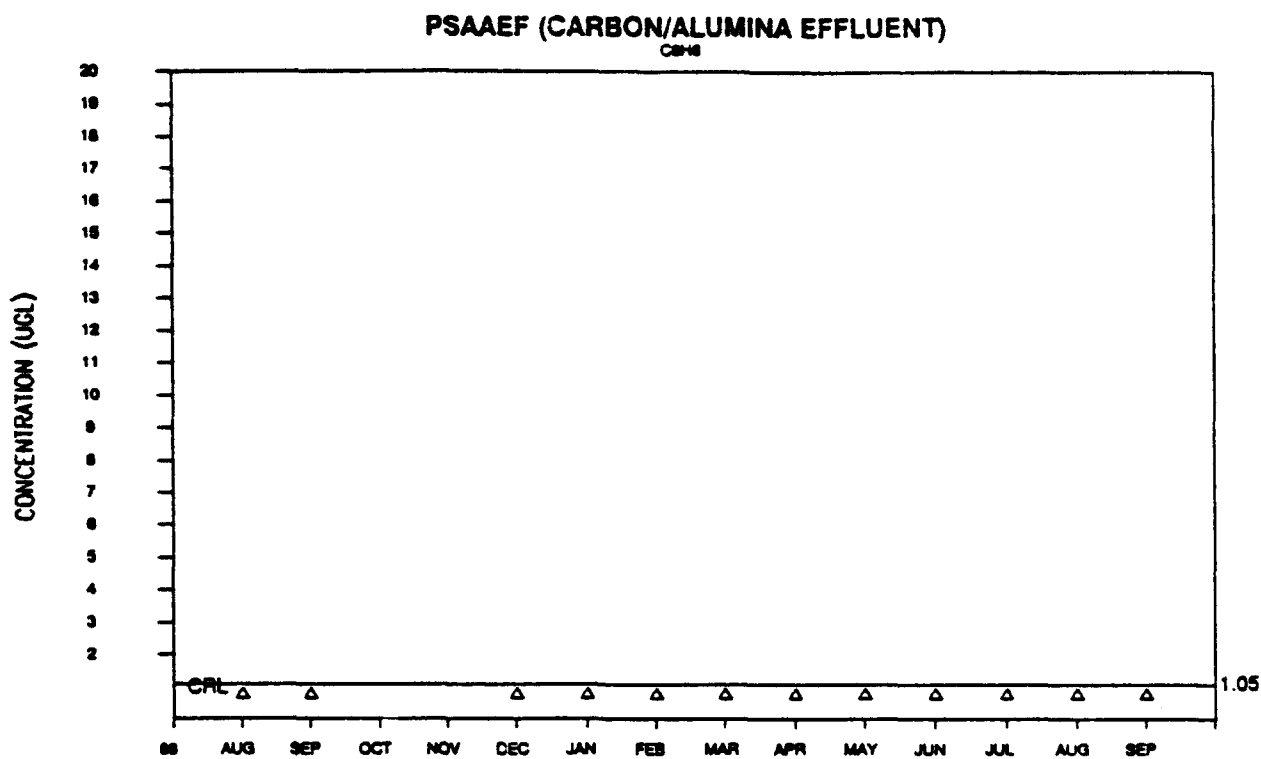


Figure 7. Benzene Concentrations (Concluded)

Methylene Chloride

26. The CRL for methylene chloride (CH_2CL_2) was 7.4 ug/l as indicated in Figure 8. A majority of the samples collected from the system influent were found to contain methylene chloride in excess of the CRL. The highest concentration found was approximately 122 ug/l. Two samples collected from the carbon/alumina effluent in December 1988 and May 1989, contained methylene chloride above the CRL with a maximum concentration of 47 ug/l. No methylene chloride above the CRL was found in any of the samples from the air stripper effluent during the study period. These data indicate that methylene chloride was a common contaminant in the CPS influent and that the treatment system effectively removed it.

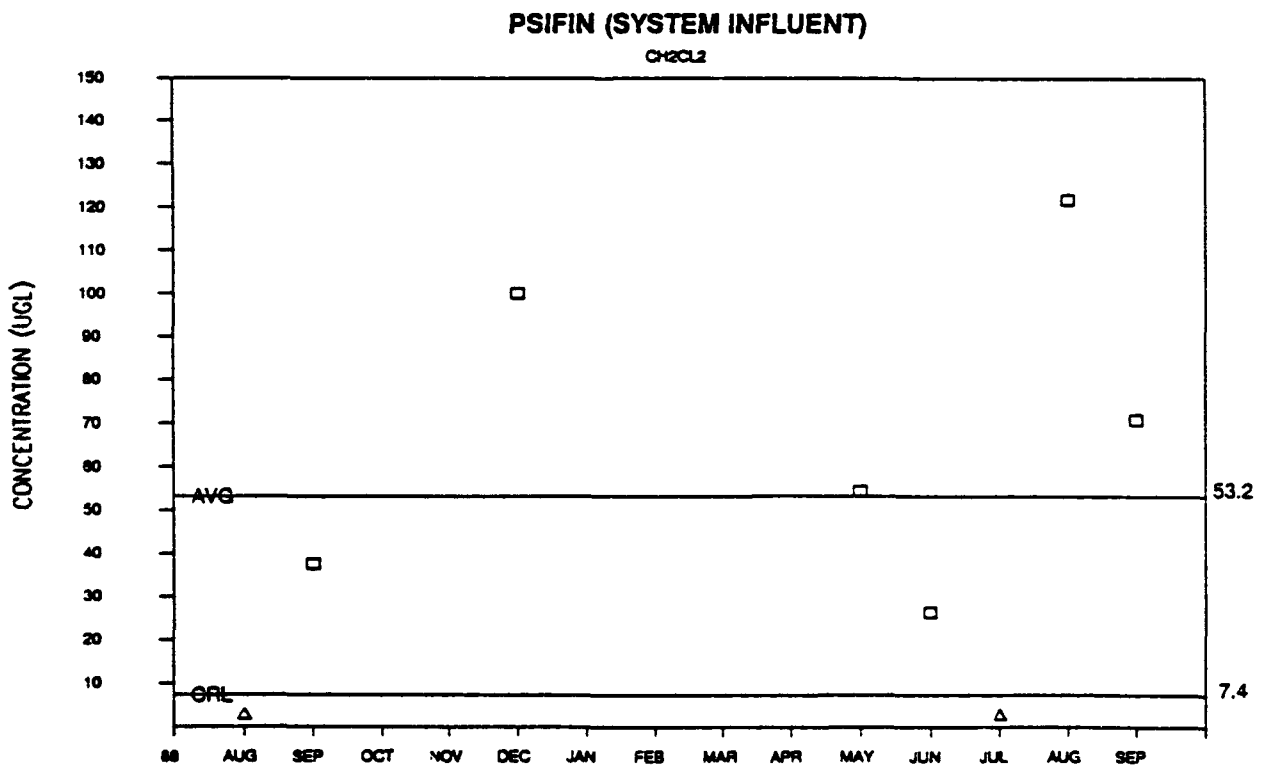


Figure 8. Methylene Chloride Concentrations (Continued)

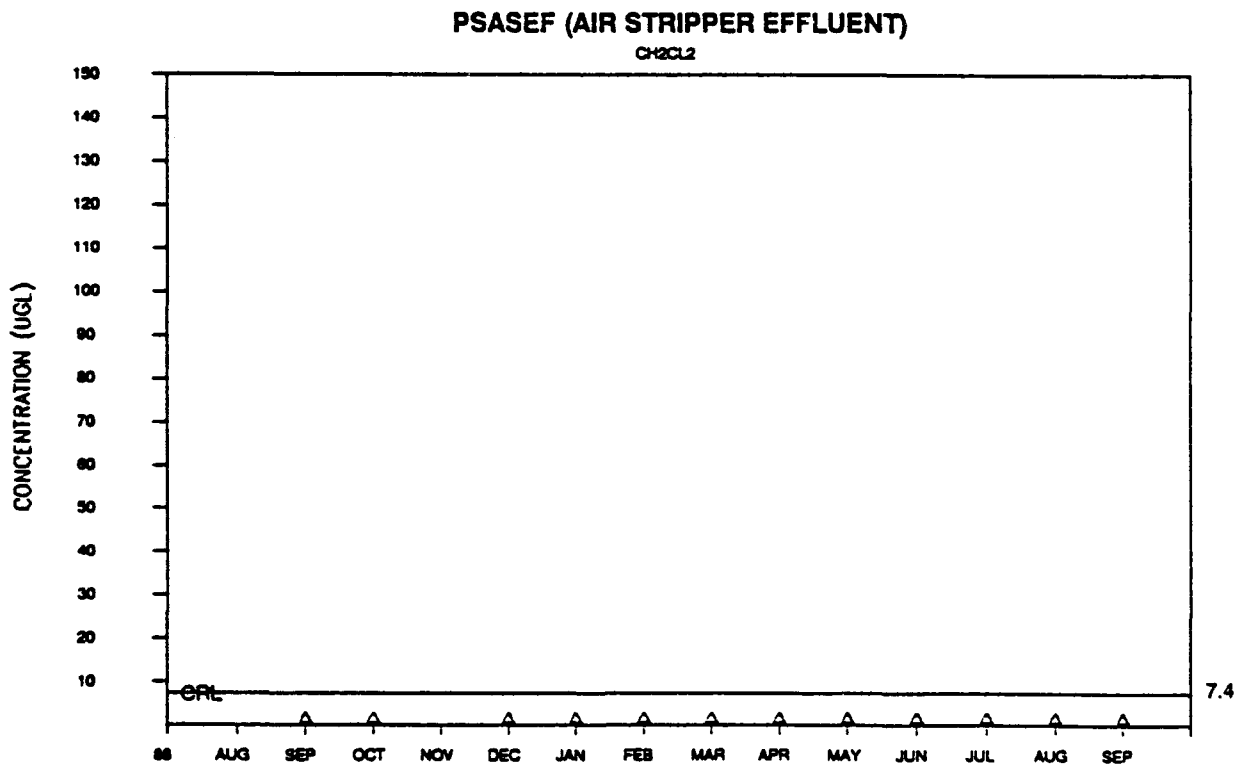
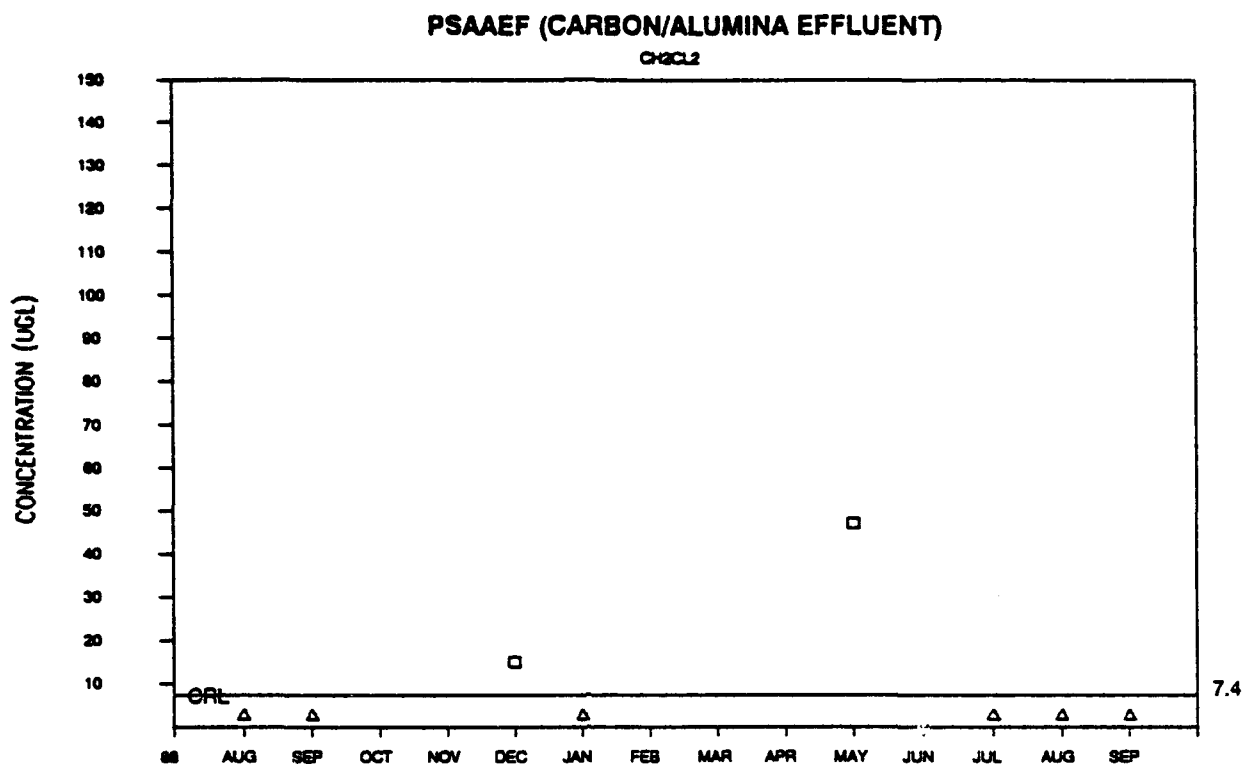


Figure 8. Methylene Chloride (Concluded)

Chloroform

27. As indicated in Figure 9, the CRL for chloroform (CHCL3) was 0.5 ug/l. All the samples collected from the system influent during the study period had concentrations of chloroform in excess of the CRL. The maximum concentration found was 148 ug/l. The average concentration in the system influent over the study period was 50.25 ug/l. Three samples collected from the carbon/alumina effluent were found to contain chloroform above the CRL with a maximum concentration of approximately 4 ug/l found in the sample collected in July 1989. One sample collected from the air stripper effluent in December 1988, had a concentration of chloroform just slightly above the CRL. The chloroform results indicate that chloroform was a major contaminant in the CPS influent during the study period and that the treatment system effectively resolved it.

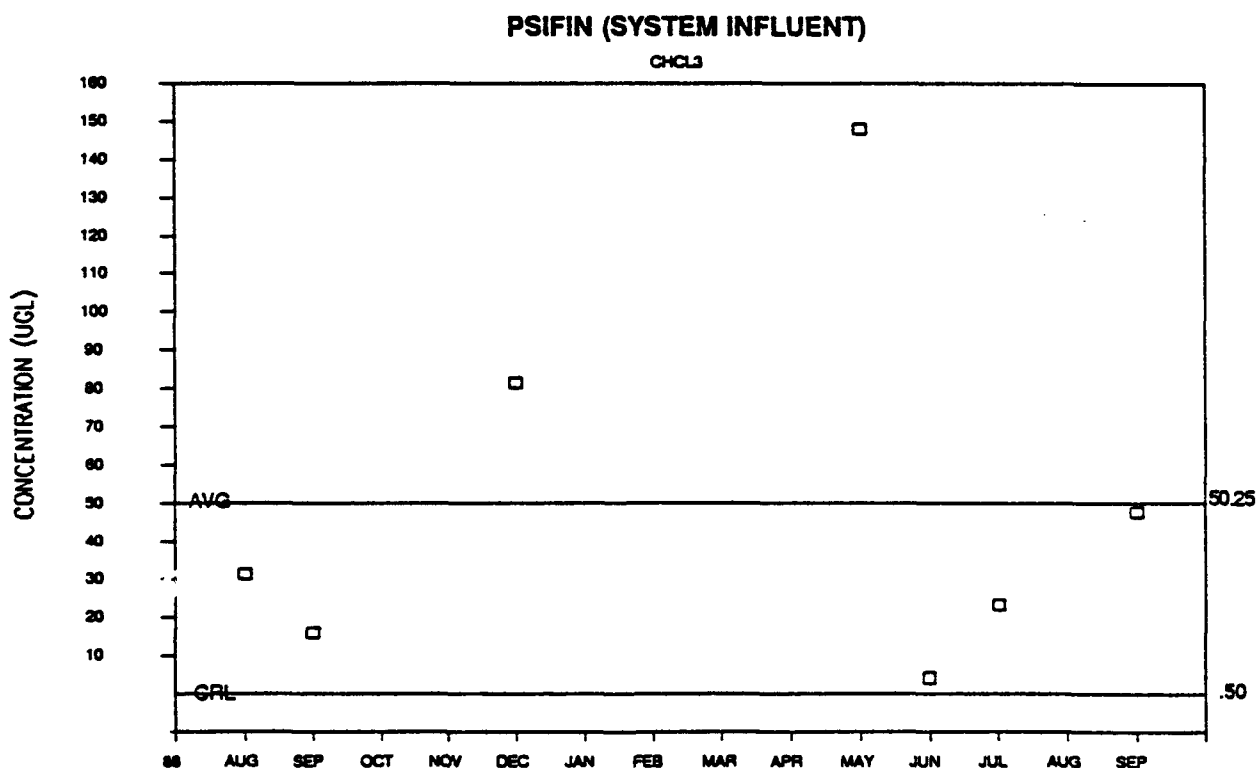


Figure 9. Chloroform Concentrations (Continued)

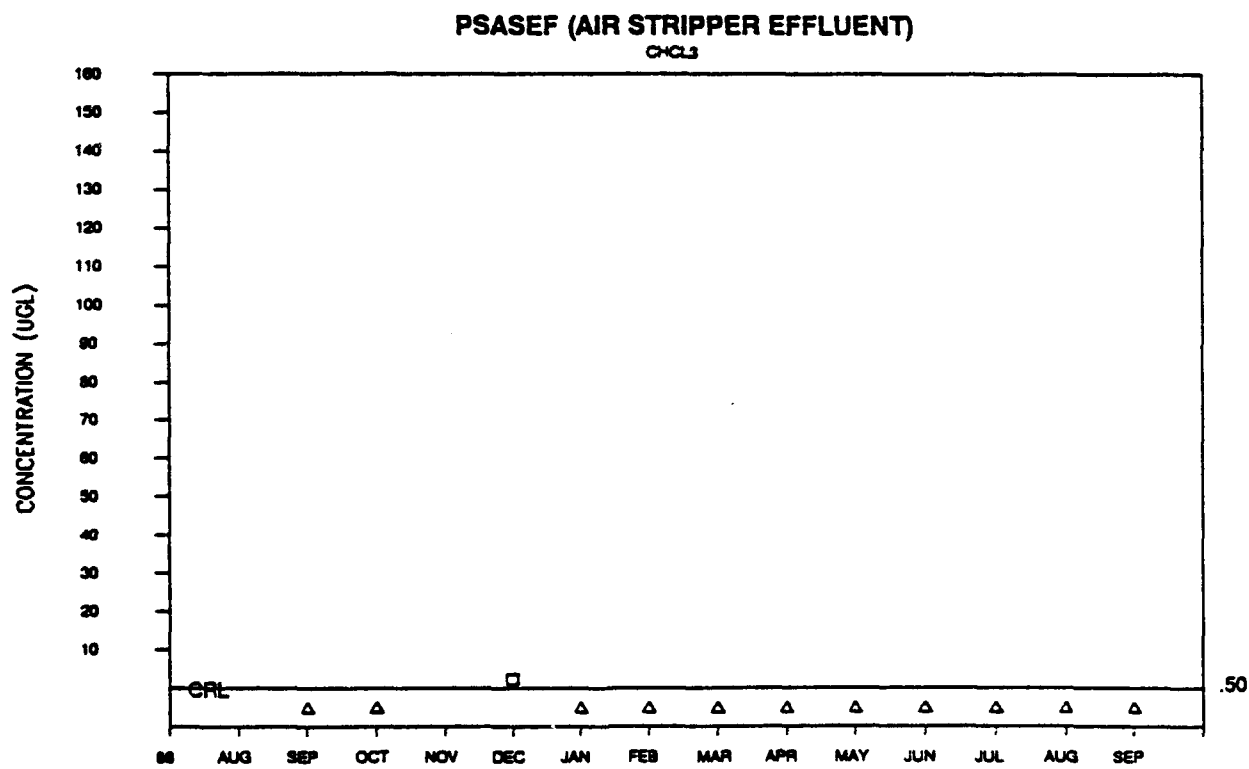
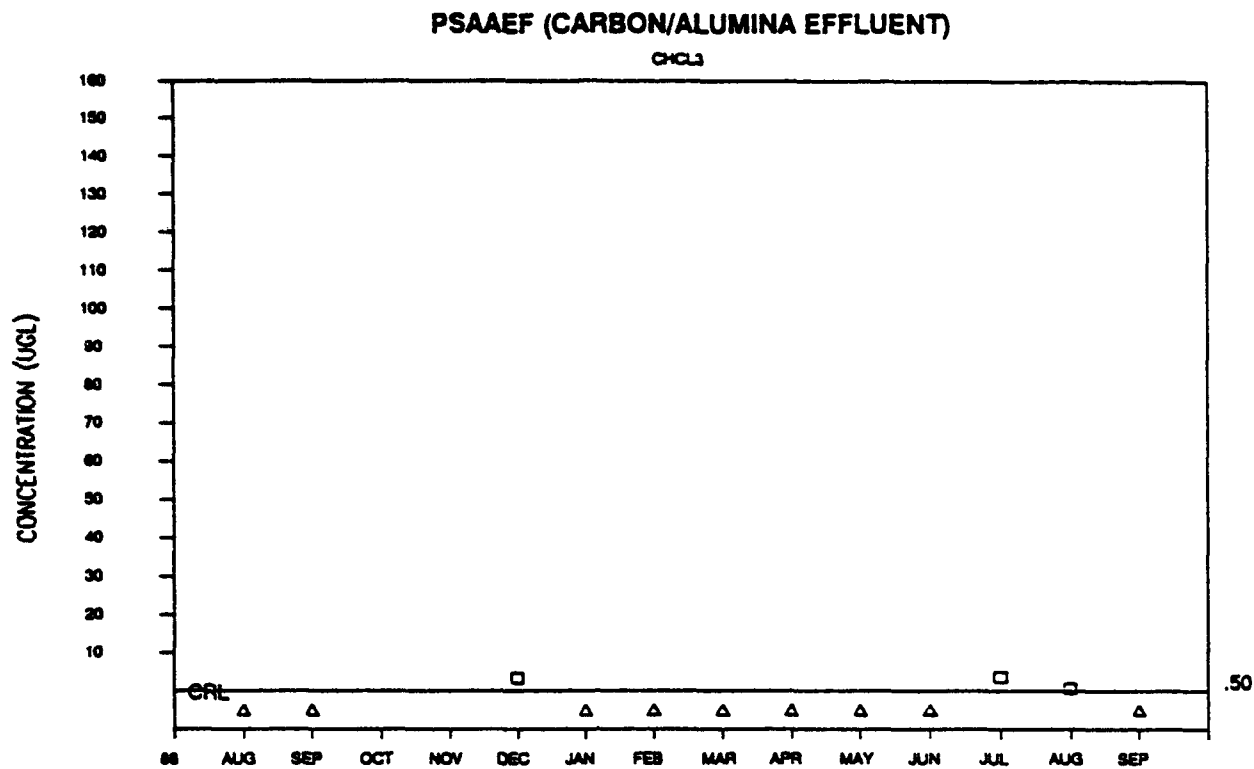


Figure 9. Chloroform (Concluded)

Chloride

28. No CRL was reported for chloride. The average chloride concentrations over the study period for the system influent, carbon/alumina effluent, and air stripper effluent were 125 mg/l, 131 mg/l, and 119 mg/l, respectively as shown in Figure 10. These data indicate that chloride was not removed by the treatment system.

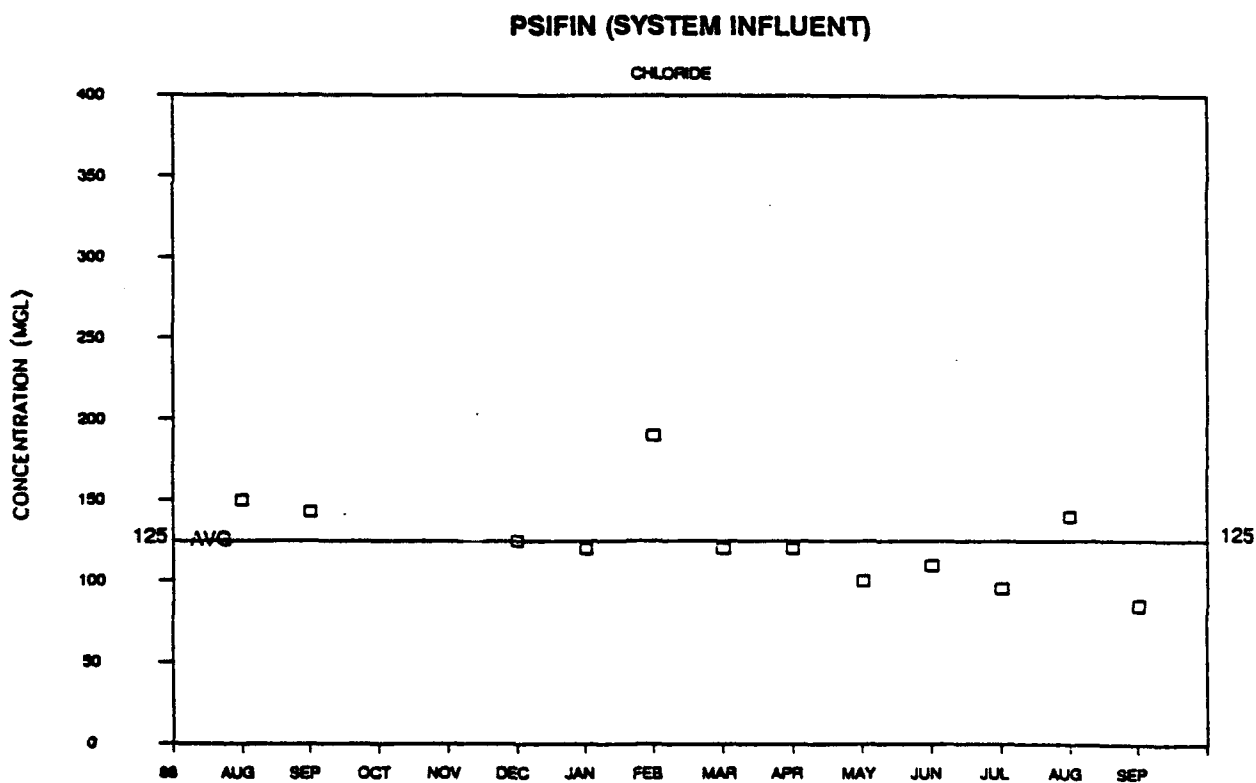
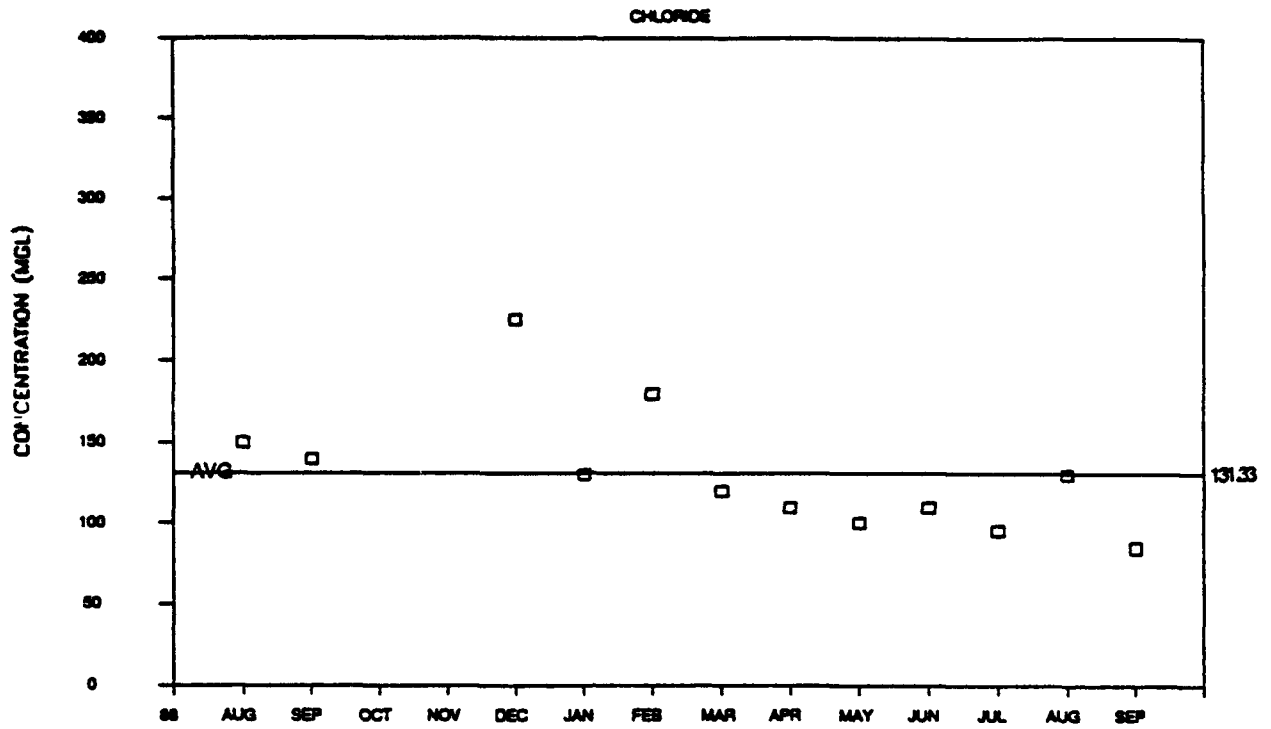


Figure 10. Chloride Concentrations (Continued)

PSAAEF (CARBON/ALUMINA EFFLUENT)



PSASEF (AIR STRIPPER EFFLUENT)

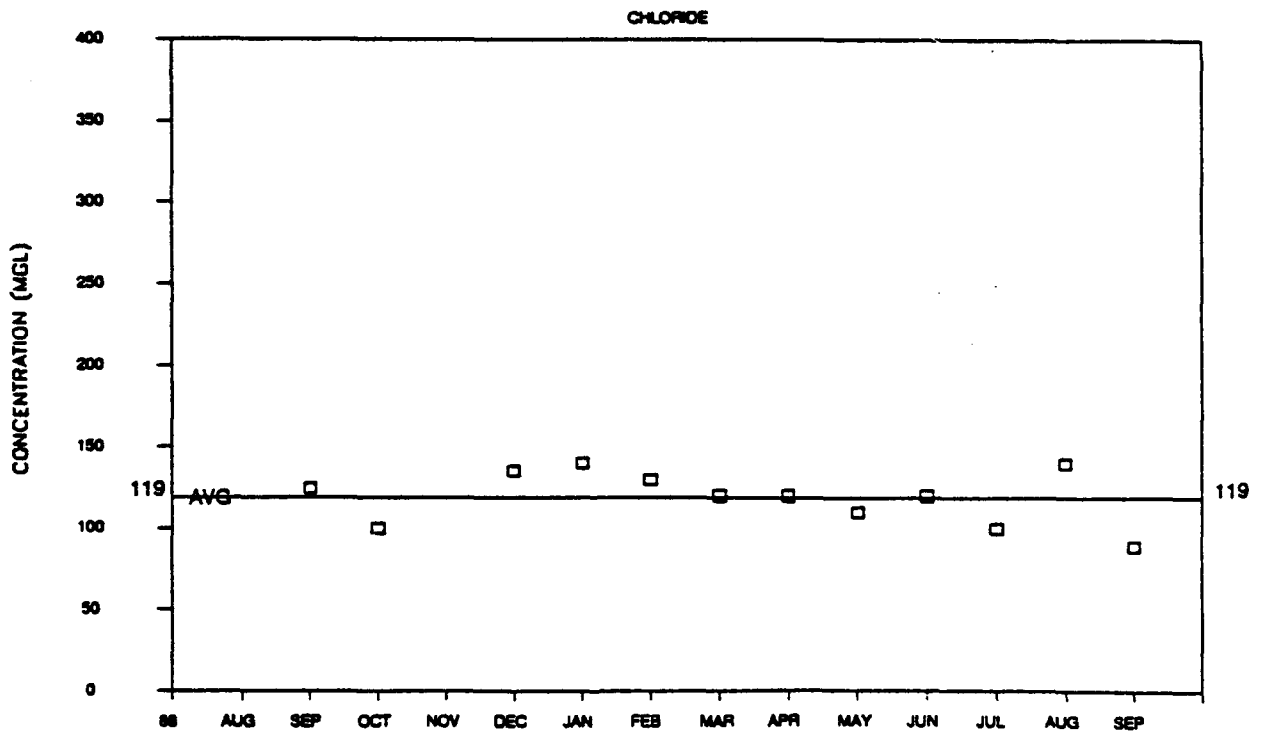


Figure 10. Chloride (Concluded)

Chlorobenzene

29. The CRL for chlorobenzene (CLC6H5) was 0.82 ug/l as indicated in Figure 11. Half of the samples collected from the system influent in FY89, were found to contain chlorobenzene above the CRL. The maximum concentration found was approximately 38 ug/l. None of the samples collected from the carbon/alumina or air stripper effluents contained chlorobenzene concentrations above the CRL. The chlorobenzene results indicate that small concentrations of the contaminant occasionally were found in the influent to the CPS and that the system effectively removed it.

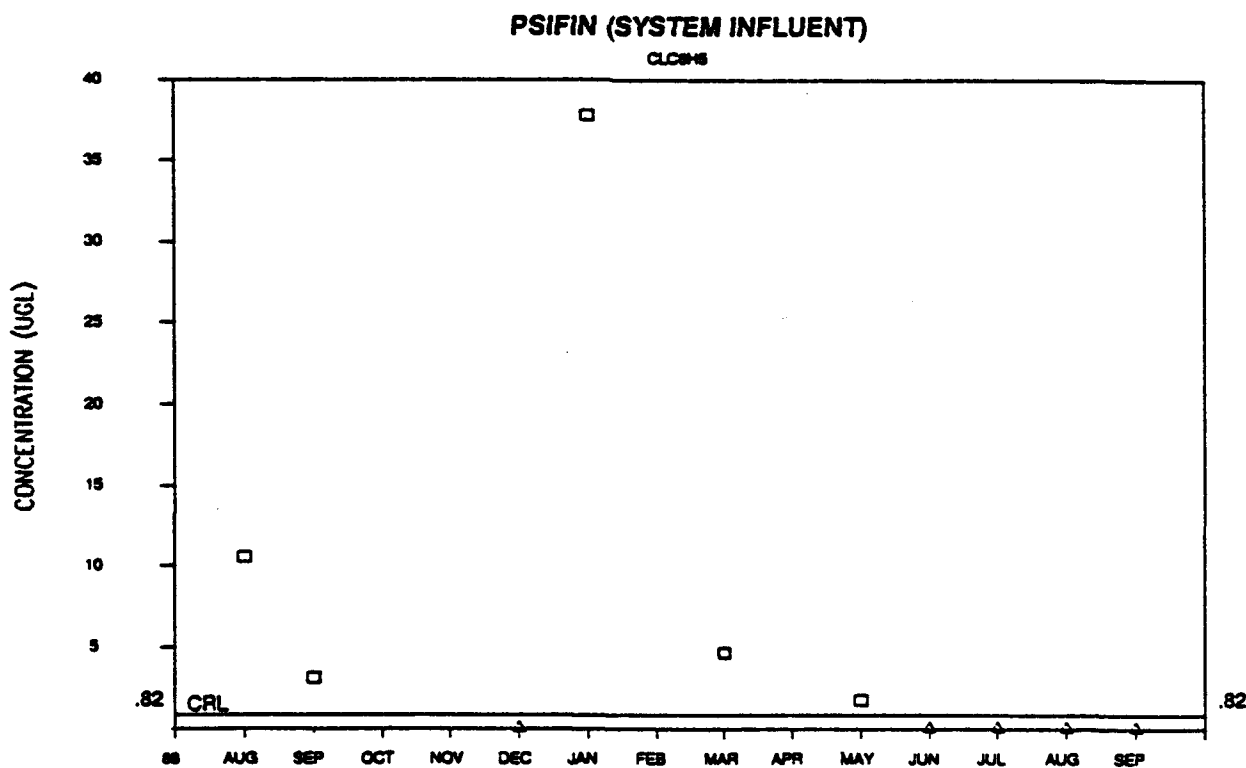
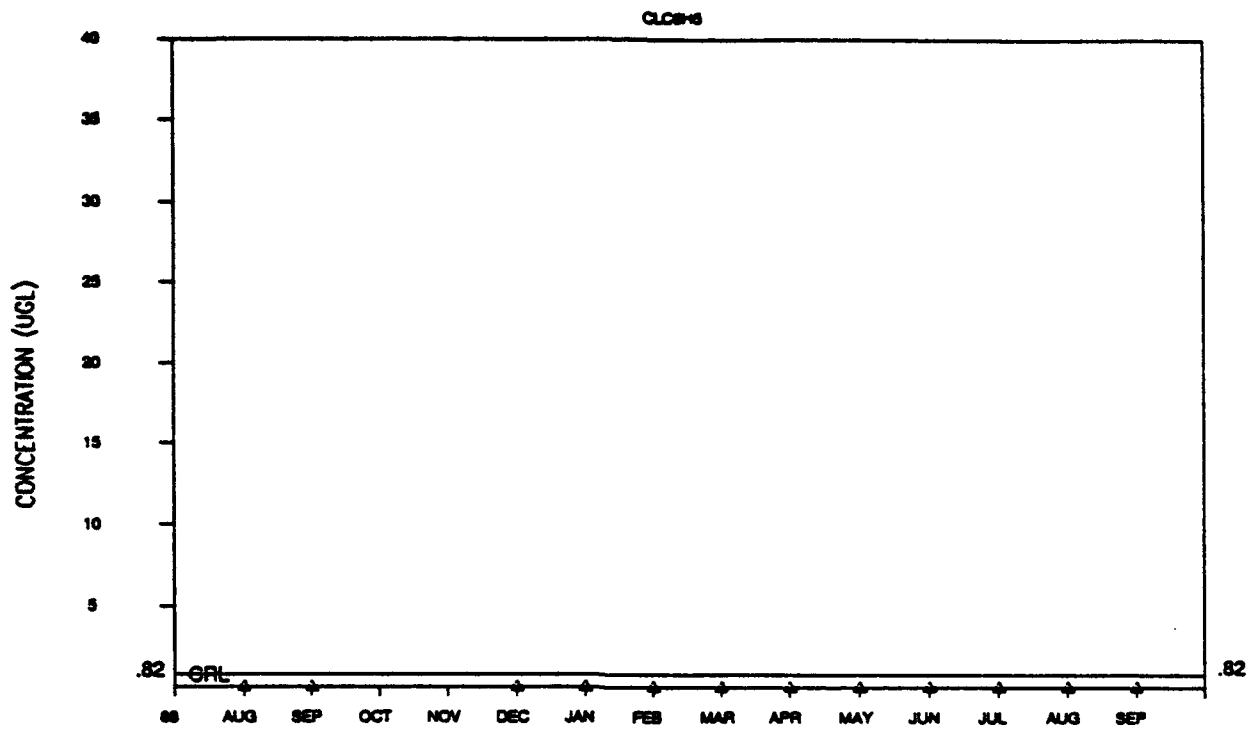


Figure 11. Chlorobenzene Concentrations (Continued)

PSAAEF (CARBON/ALUMINA EFFLUENT)



PSASEF (AIR STRIPPER EFFLUENT)

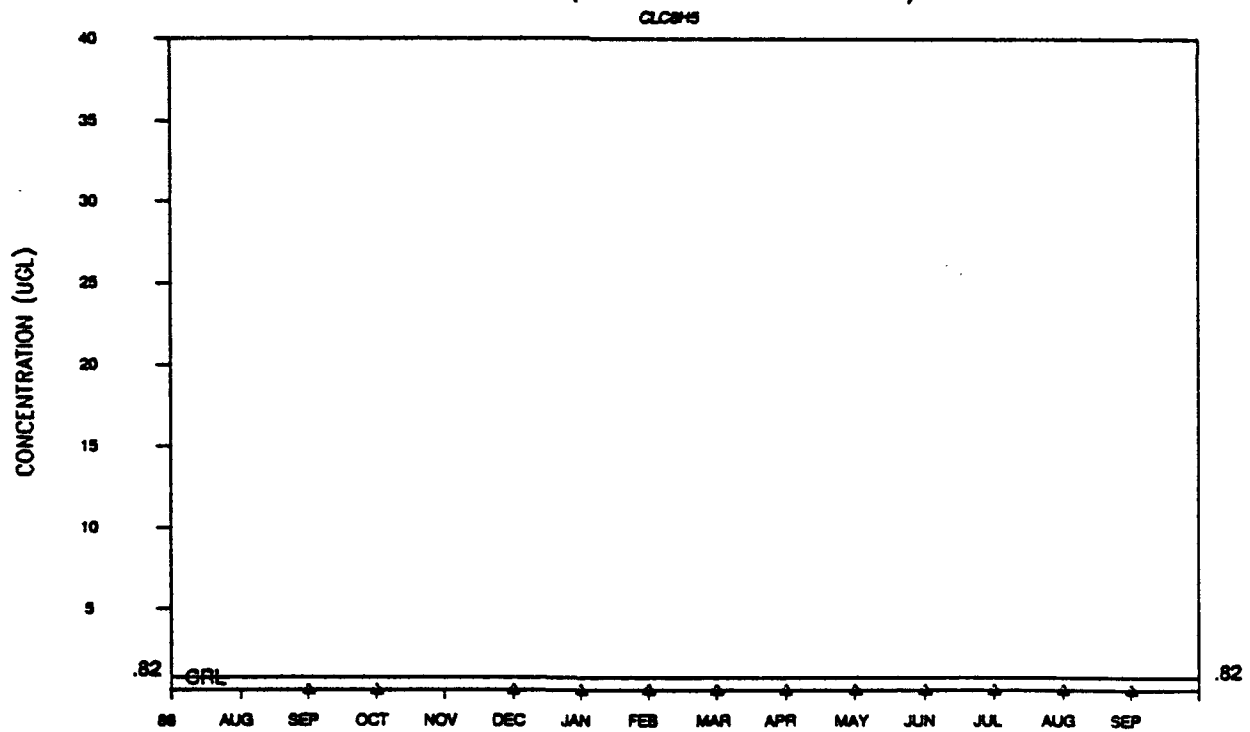


Figure 11. Chlorobenzene (Concluded)

Chlordane

30. The CRL for chlordane (CLDAN) was 0.095 ug/l as indicated in Figure 12. Over half of the samples collected from the system influent in FY89 contained chlordane above the CRL with a maximum concentration of approximately 1.2 ug/l found. None of the samples from the carbon/alumina or air stripper effluents were found to contain chlordane above the CRL. These results indicate that small concentrations of chlordane were occasionally found in the influent to the CPS and that the system effectively removed it.

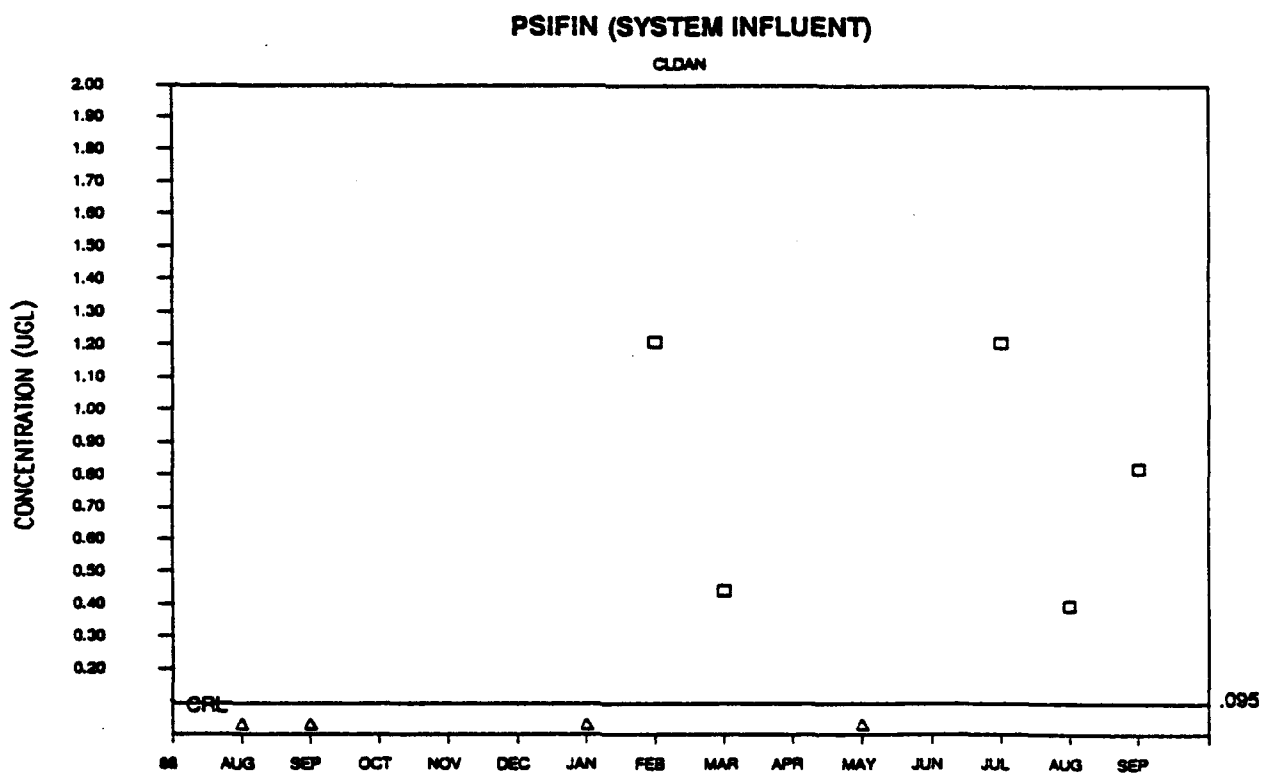


Figure 12. Chlordane Concentrations (Continued)

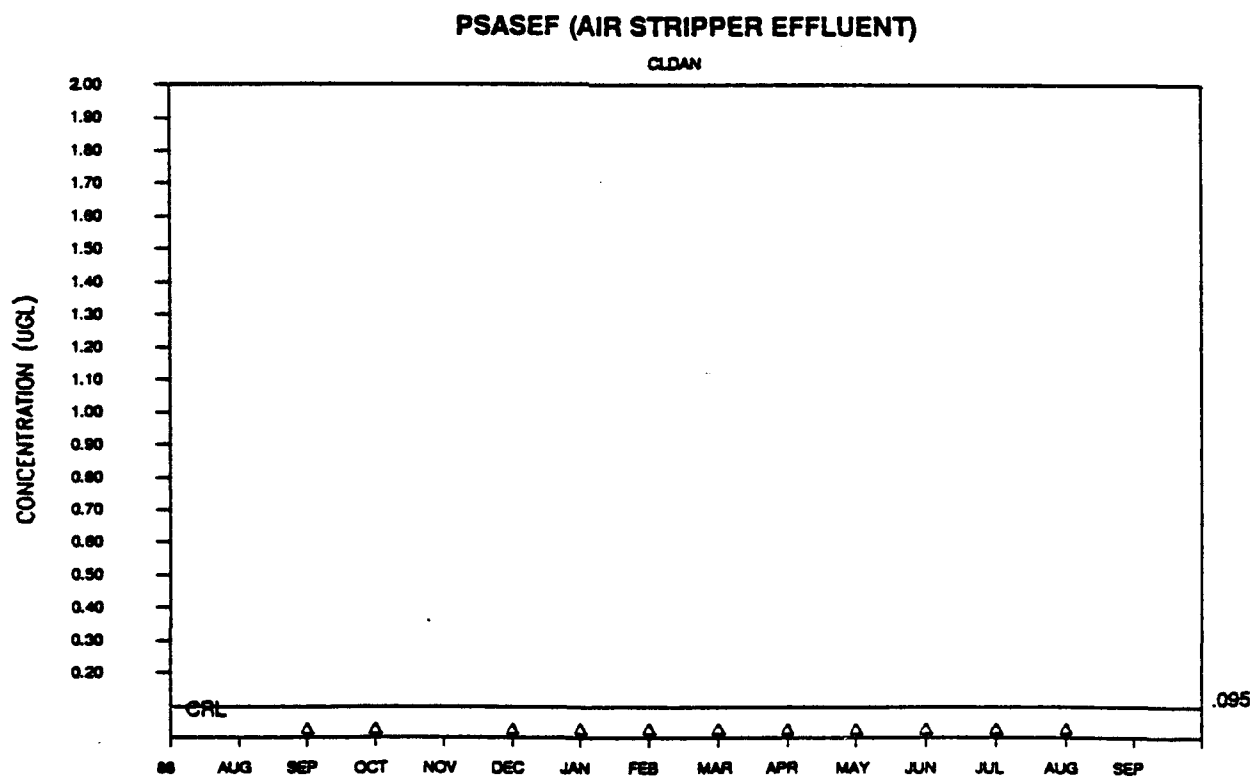
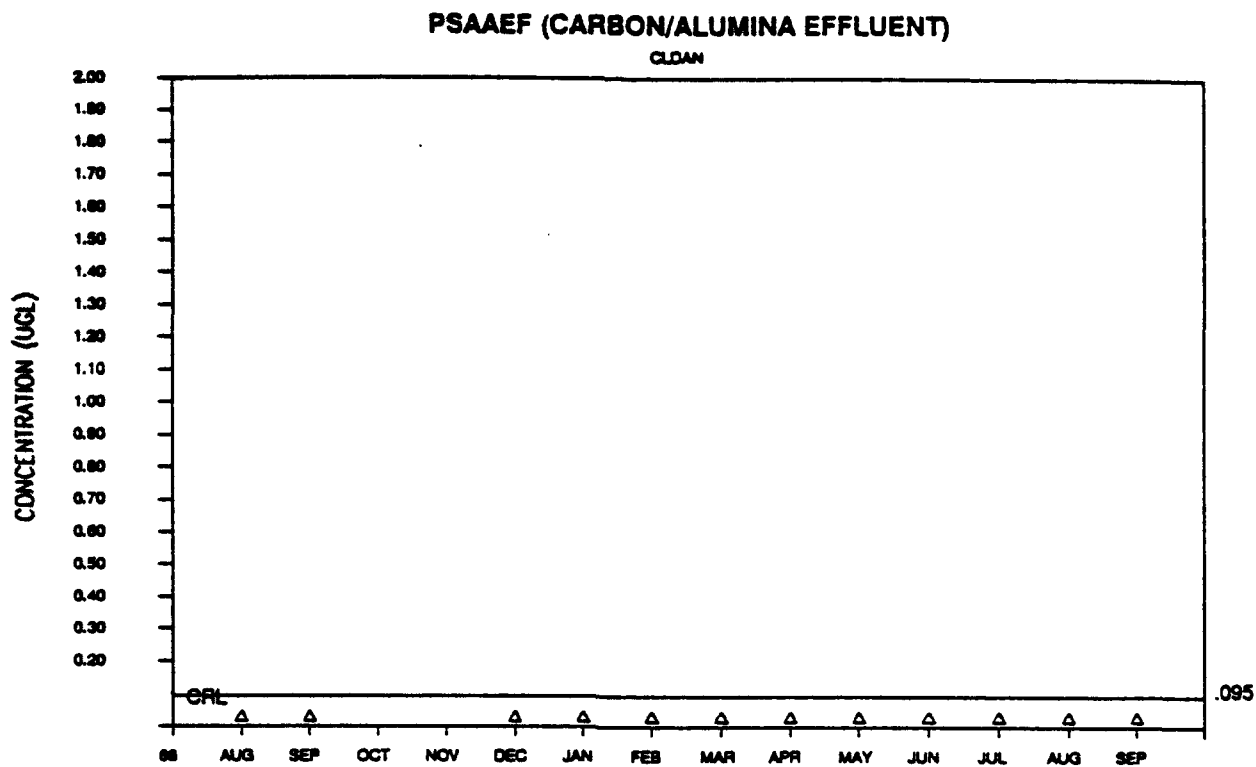


Figure 12. Chlordane (Concluded)

p - Chlorophenylmethyl Sulfoxide

31. As indicated in Figure 13, the CRL for p - chloro-phenylmethyl sulfoxide (CPMSO) was 11.5 ug/l. Approximately half of the samples collected from the system influent and the carbon/alumina effluent were found to contain CPMSO above the CRL. The maximum concentrations found in the system influent and the carbon/alumina effluent were approximately 40 ug/l and 52 ug/l, respectively. No samples collected from the air stripper effluent during the study period contained CPMSO in excess of the CRL. In summary, CPMSO was found in approximately half of the system influent samples collected during the study period and the CPS successfully removed it.

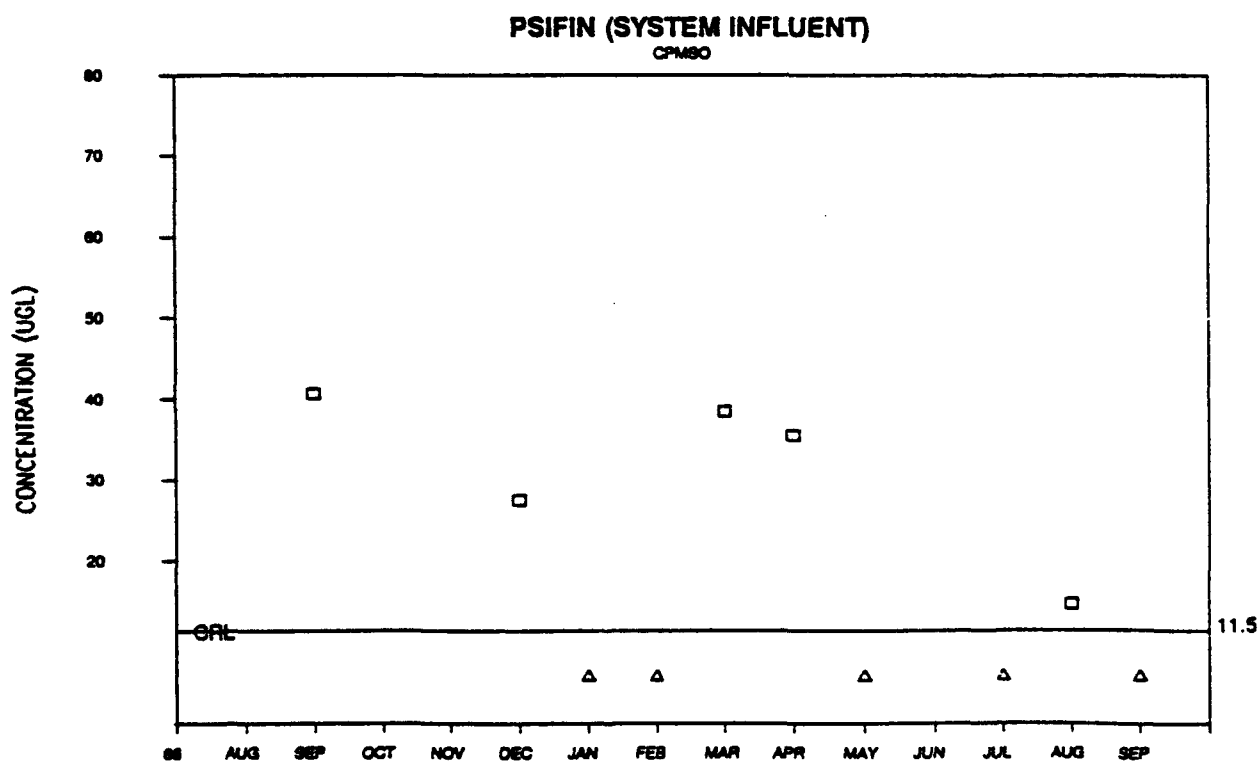


Figure 13. p-chlorophenylmethyl Sulfoxide Concentration (Continued)

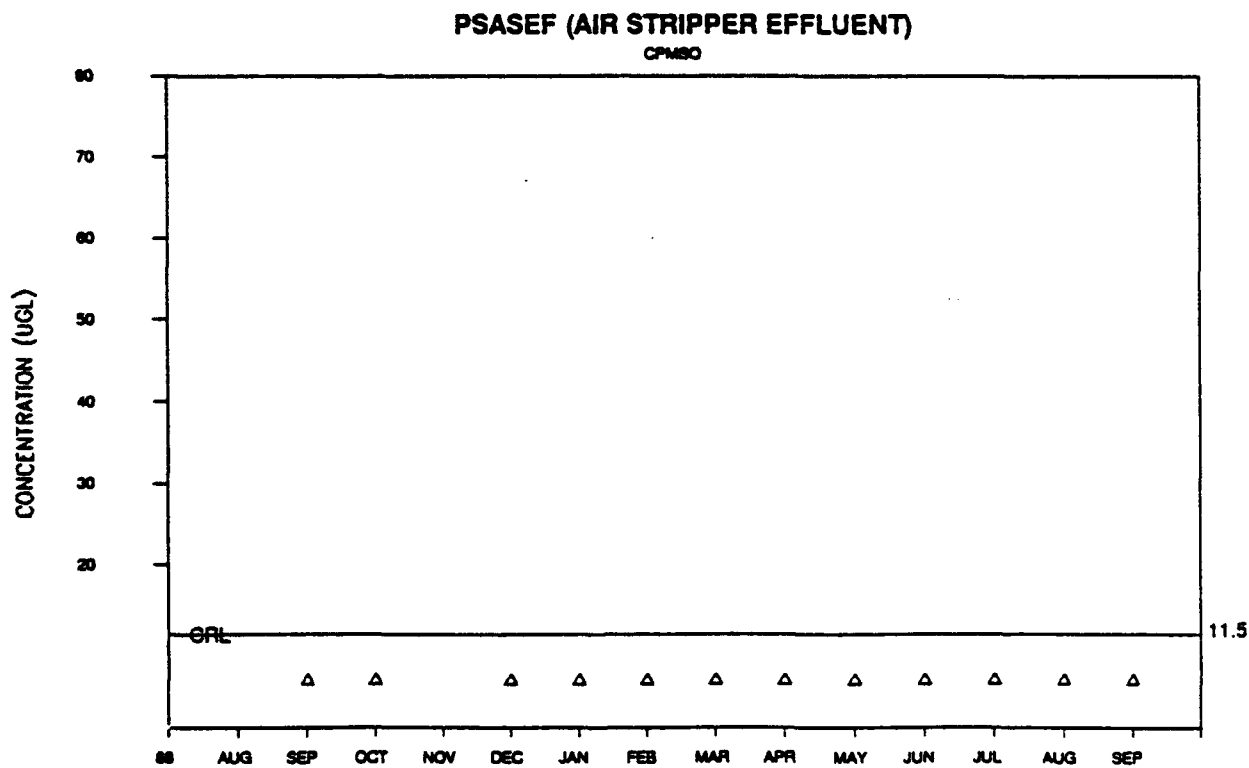
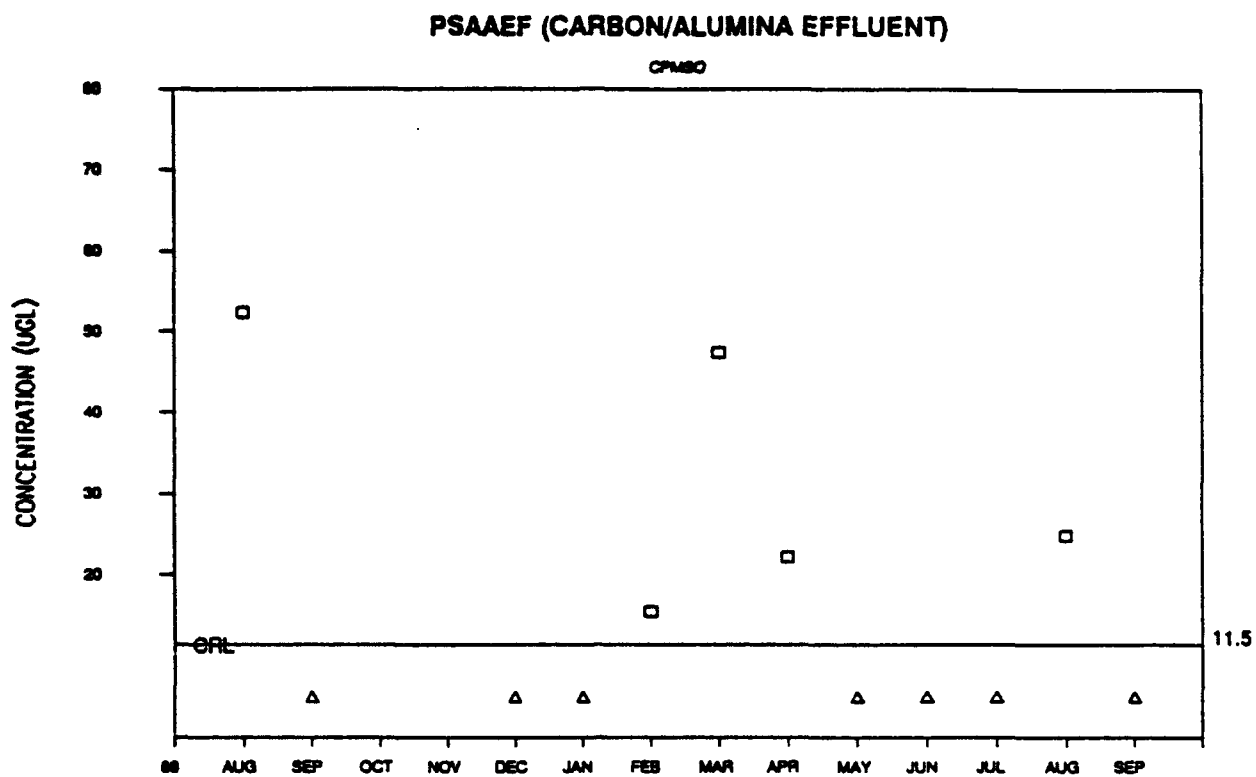


Figure 13. p-chlorophenylmethyl Sulfoxide (Concluded)

p - Chlorophenylmethyl Sulfone

32. The CRL for p - chlorophenylmethyl sulfone (CPMSO₂) was 7.46 ug/l as indicated in Figure 14. A majority of the samples collected from the system influent were found to contain CPMSO₂ above the CRL. The maximum concentration found was approximately 30 ug/l. The average concentration over the study period was 16.23 ug/l. Approximately half of the samples collected from the carbon/alumina effluent contained CPMSO₂ above the CRL with a maximum concentration of approximately 65 ug/l. A single sample collected from the air stripper effluent in August 1989 had a CPMSO₂ concentration in excess of the CRL. These results indicate that CPMSO₂ was a common contaminant in the CPS influent during the study period and that the treatment system was generally successful in removing it.

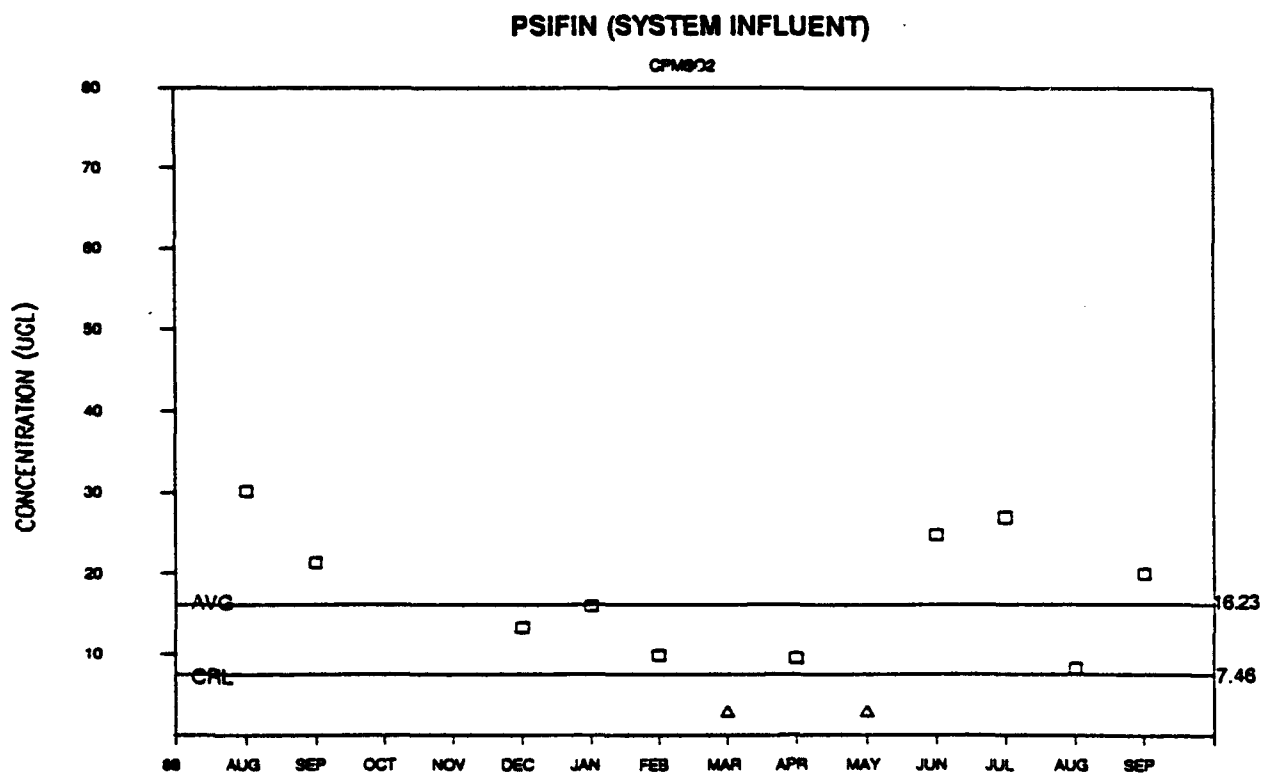


Figure 14. p-chlorophenylmethyl sulfone concentration (Continued)

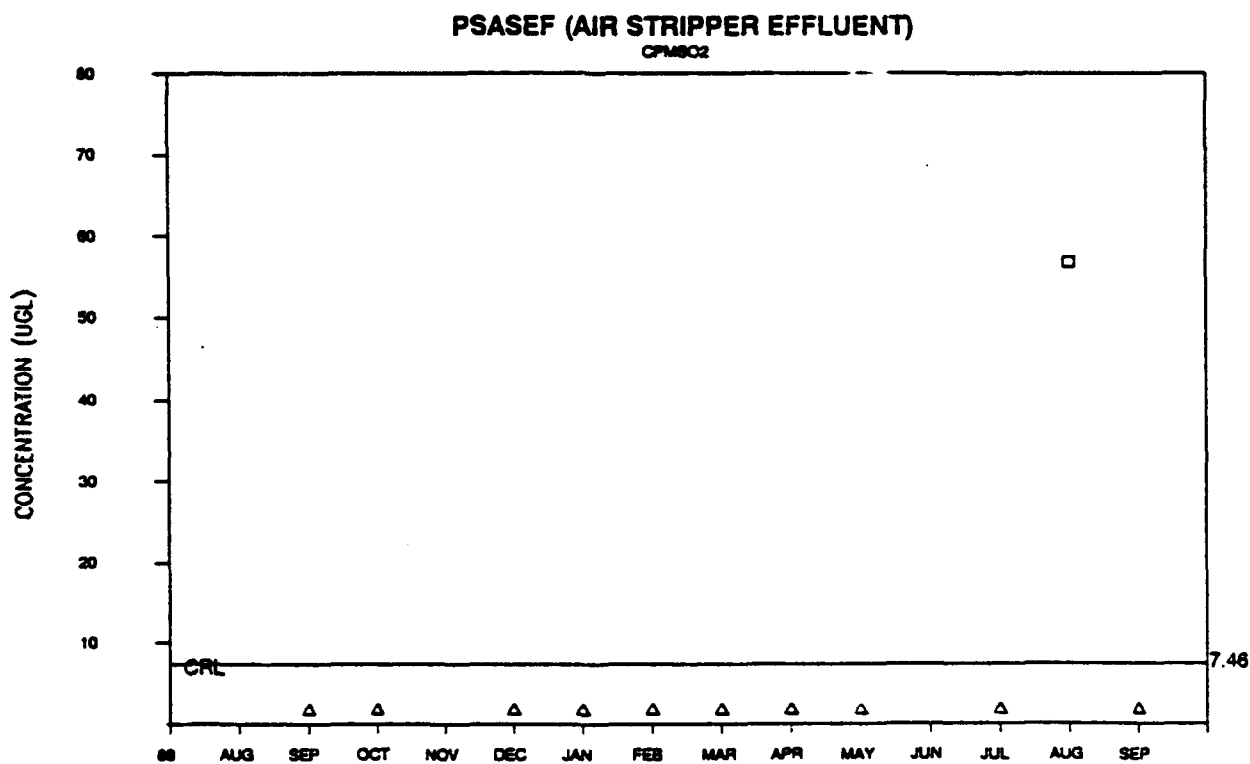
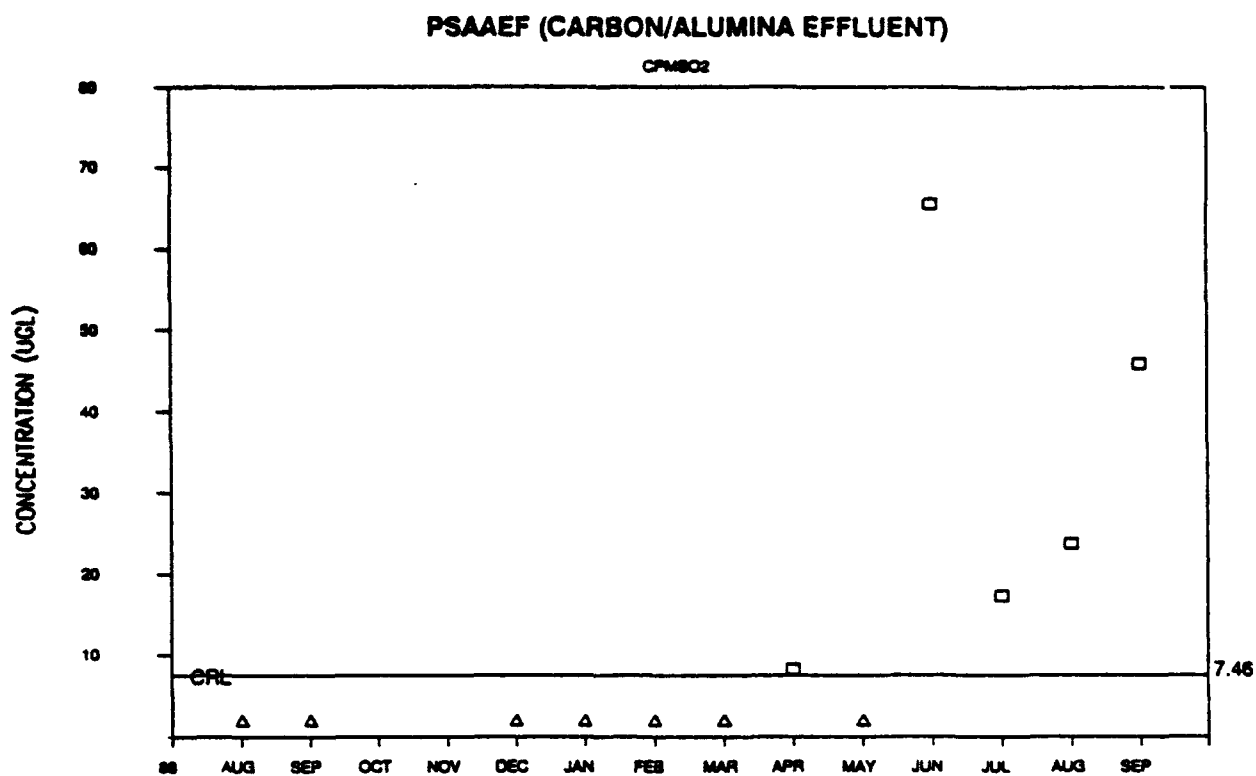


Figure 14. p-chlorophenylmethyl Sulfone (Concluded)

Dibromochloropropane

33. The CRL for dibromochloropropane (DBCP) was 0.195 ug/l as indicated in Figure 15. Approximately half of the samples collected from the system influent were found to contain DBCP above the CRL. The maximum concentration found was approximately 2.25 ug/l. None of the samples collected from the carbon/alumina or air stripper effluents contained DBCP concentrations above the CRL. In summary, DBCP was found in approximately half of the system influent samples collected during the study period and the CPS successfully removed it.

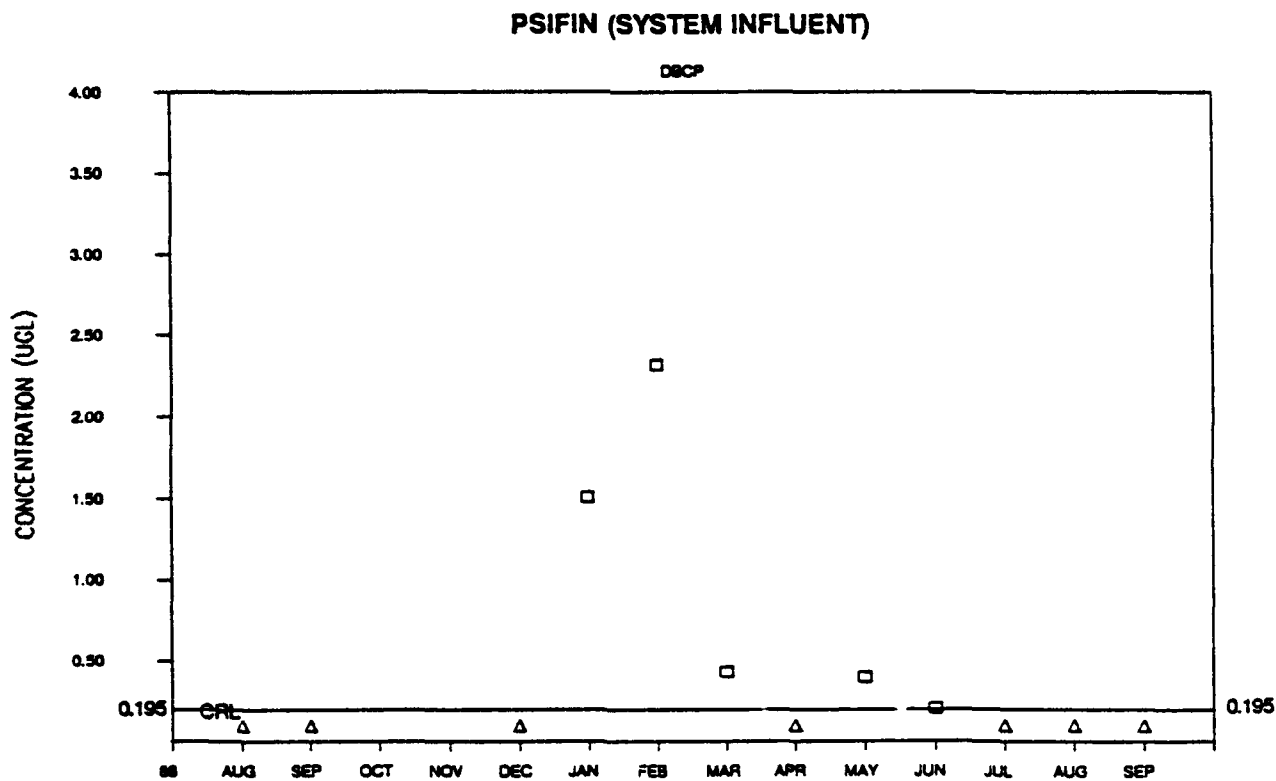
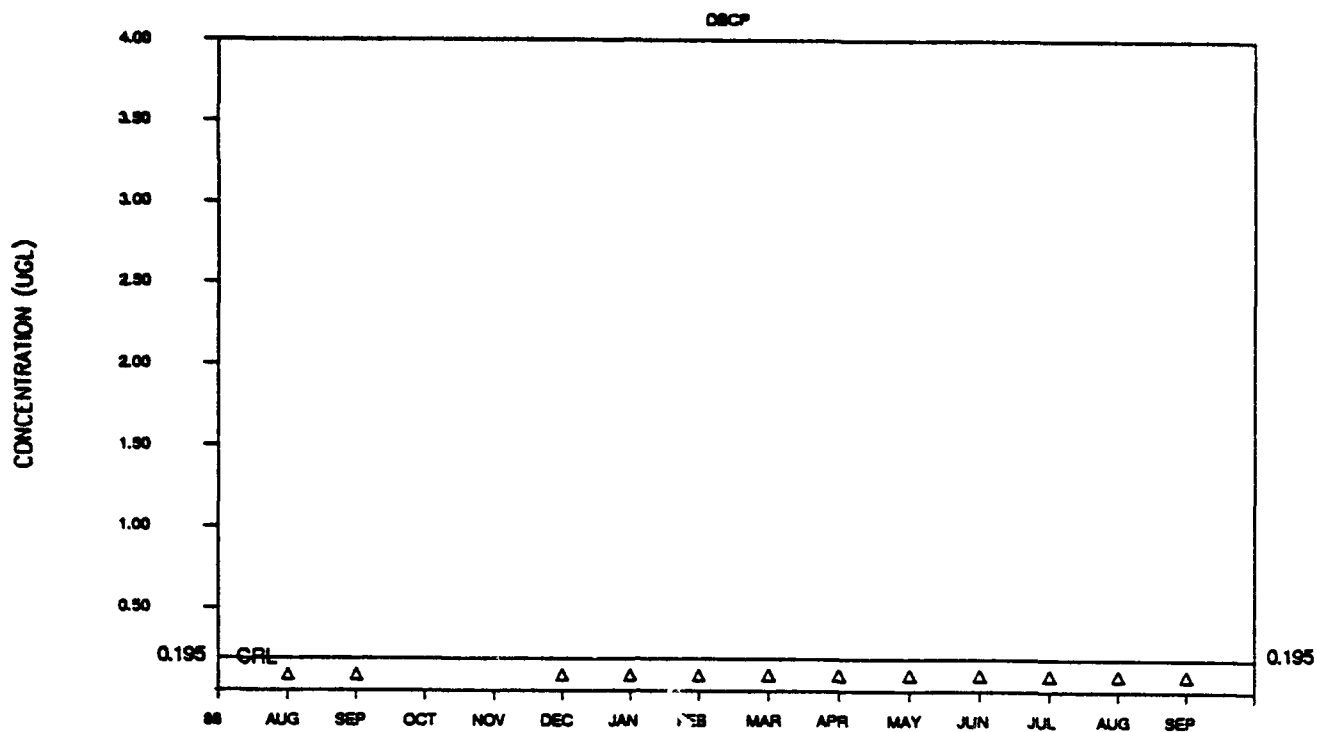


Figure 15. Dibromochloropropane Concentration (Continued)

PSAAEF (CARBON/ALUMINA EFFLUENT)



PSASEF (AIR STRIPPER EFFLUENT)

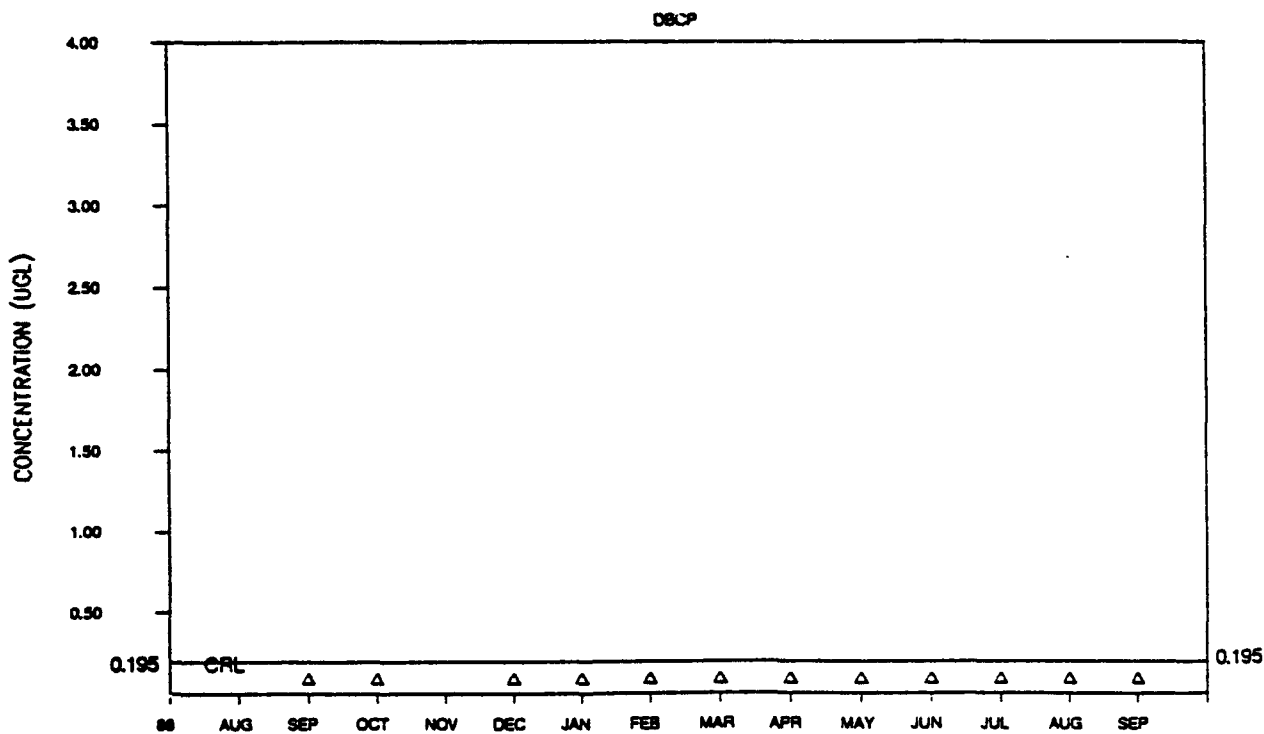


Figure 15. Dibromochloropropane (Concluded)

Dicyclopentadine

34. The CRL for dicyclopentadine (DCPD) was 5.0 ug/l as indicated in Figure 16. Approximately half of the samples collected from the system influent were found to contain DCPD above the CRL. The sample collected in June, 1989, had the maximum concentration found, approximately 11.5 ug/l. None of the samples collected from the carbon/alumina or air stripper effluents had DCPD concentrations above the CRL. These results indicate that approximately half of the system influent samples collected during the study period contained DCPD with the majority of them having only small concentrations. The CPS effectively removed DCPD over the study period.

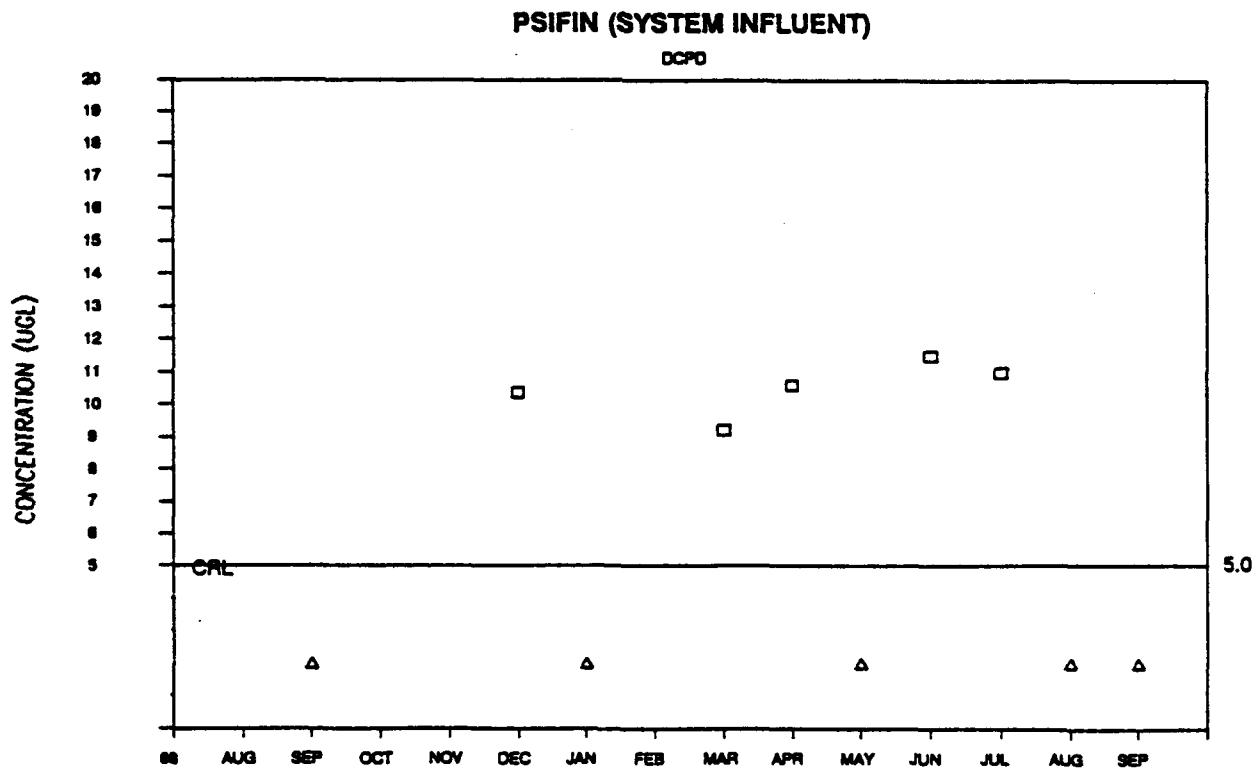


Figure 16. Dicyclopentadine Concentration (Continued)

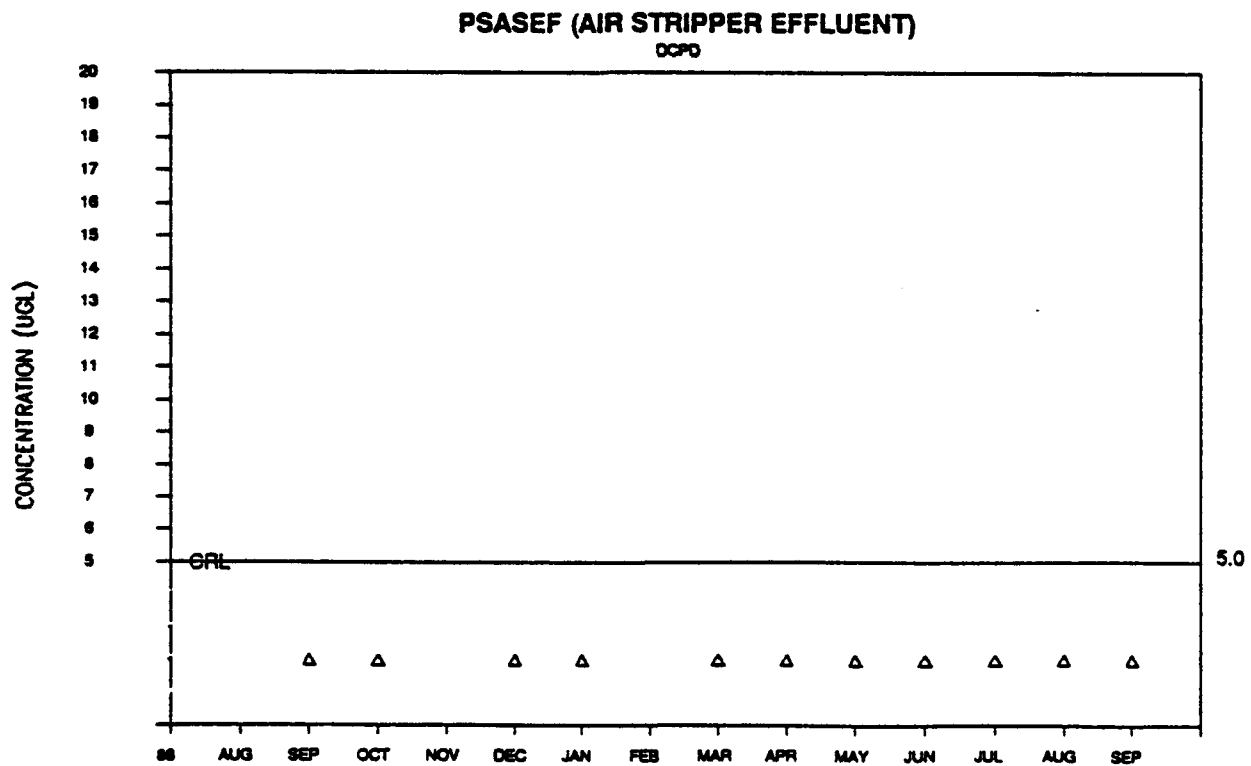
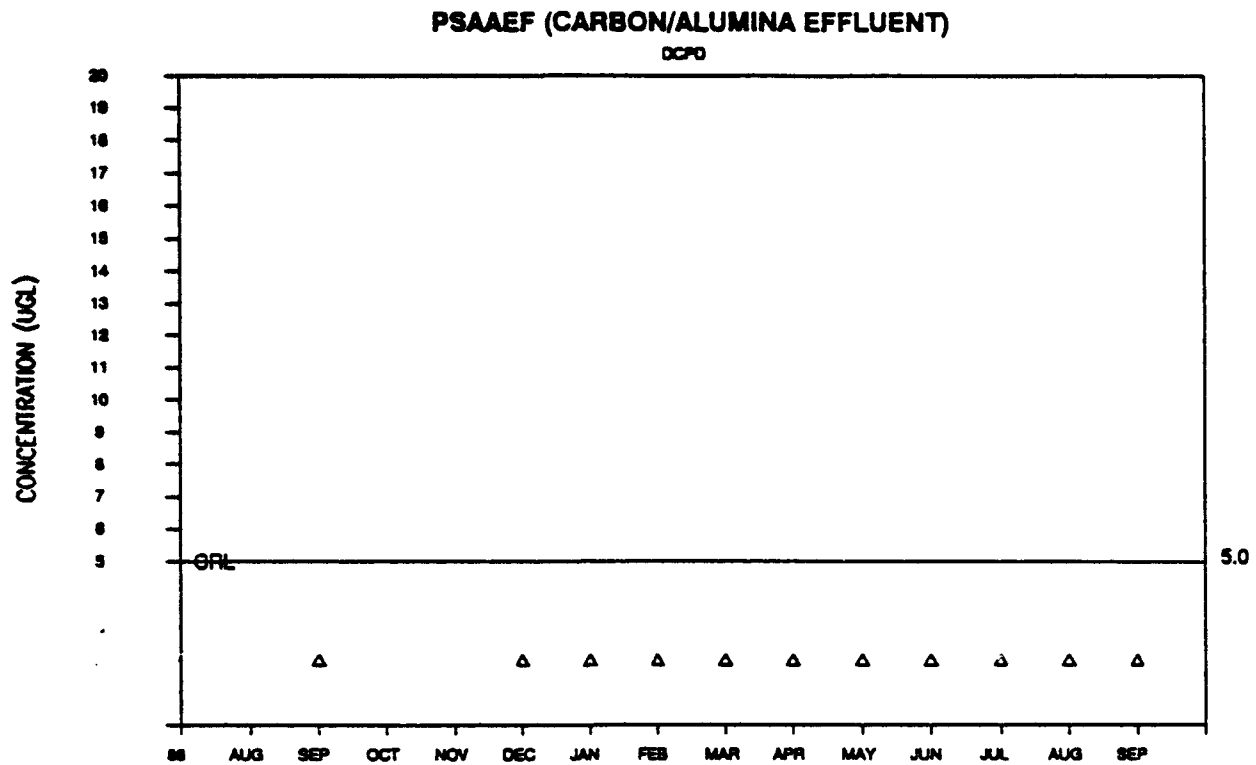


Figure 16. Dicyclopentadine (Concluded)

Vapona

35. As indicated in Figure 17, the CRL for vapona (DDVP) was 0.384 ug/l. Three of the samples collected from the system influent over the study period contained vapona in excess of the CRL. These samples were collected in September, 1988, March 1989, and April 1989. The maximum concentration found was approximately 20 ug/l. No concentrations of vapona above the CRL were found in any of the samples collected from the carbon/alumina effluent. Three samples collected from the air stripper effluent were found to contain vapona in excess of the CRL. The maximum concentration found was approximately 49 ug/l in the September, 1989 sample. This concentration is higher than was found in any of the system influent samples. In summary, small concentrations of vapona were found in some of the influent samples to the CPS. Concentrations in excess of the CRL were also found in the effluent indicating that the treatment system was not successful in removing vapona to below the CRL.

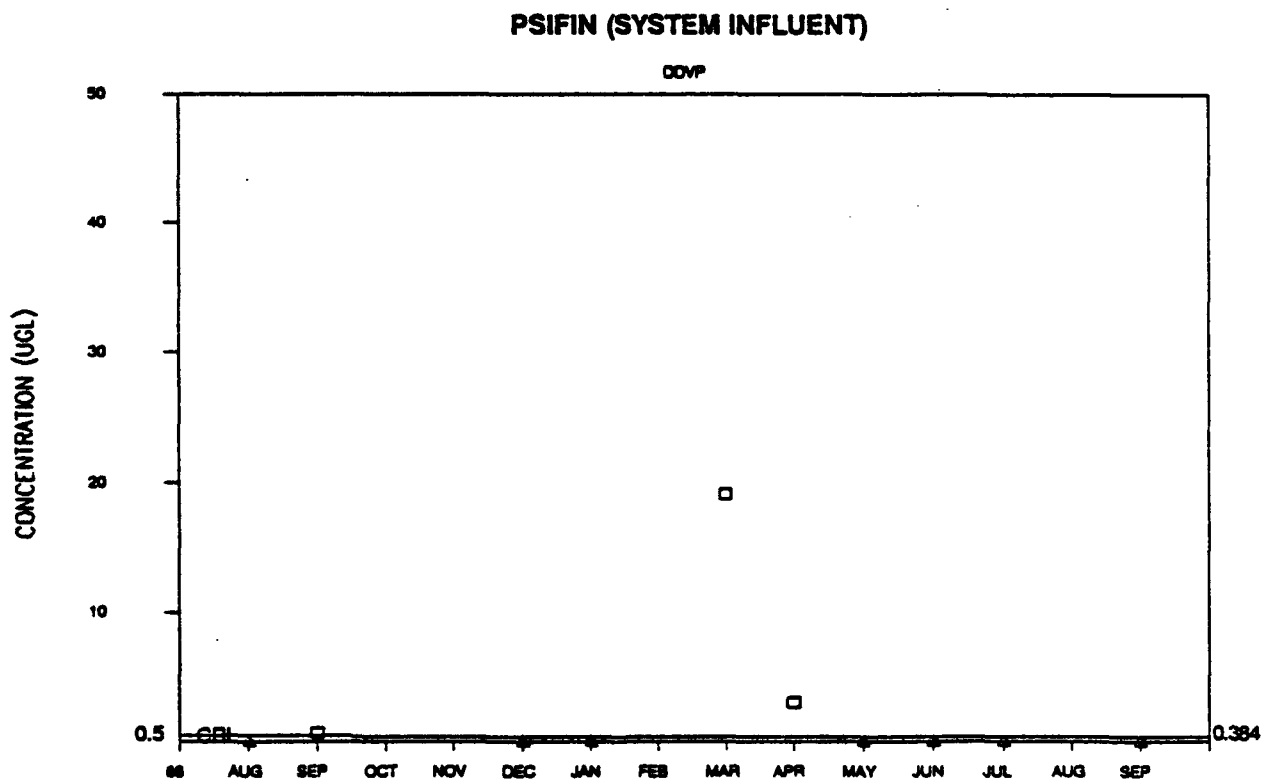
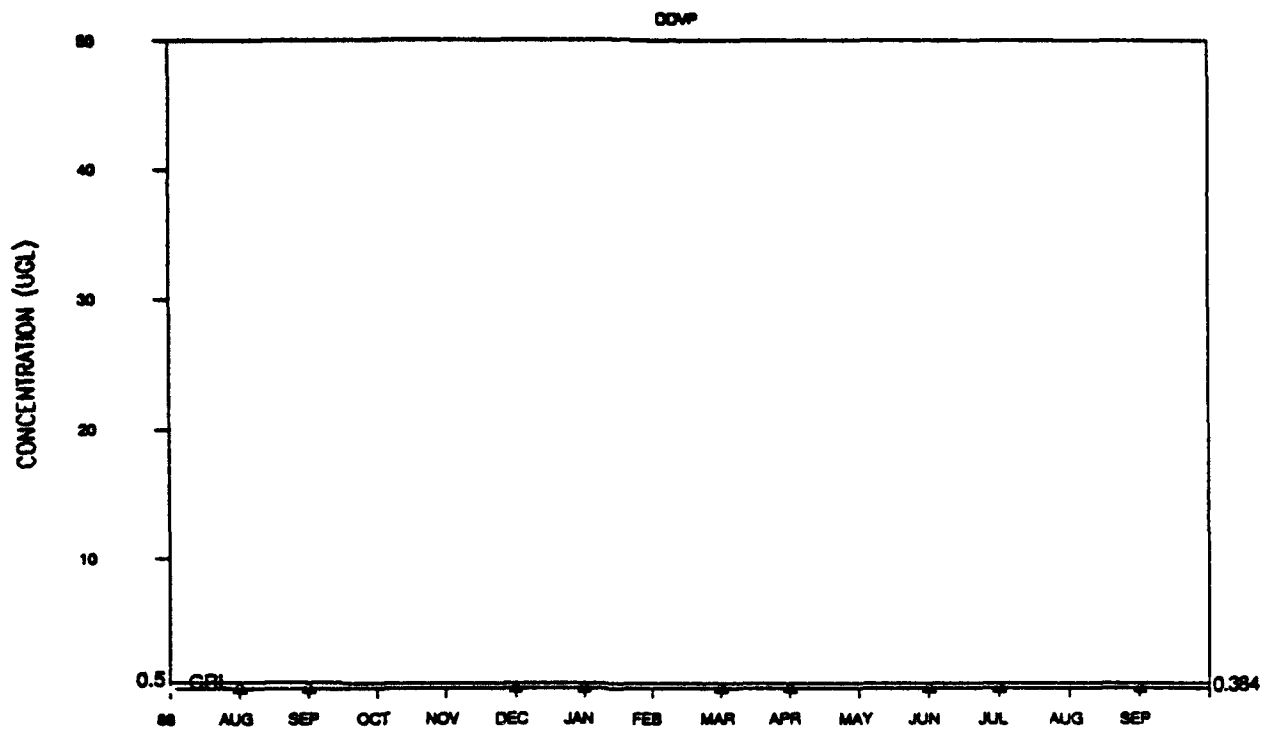


Figure 17. Vapona Concentrations (Continued)

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PSASEF (AIR STRIPPER EFFLUENT)

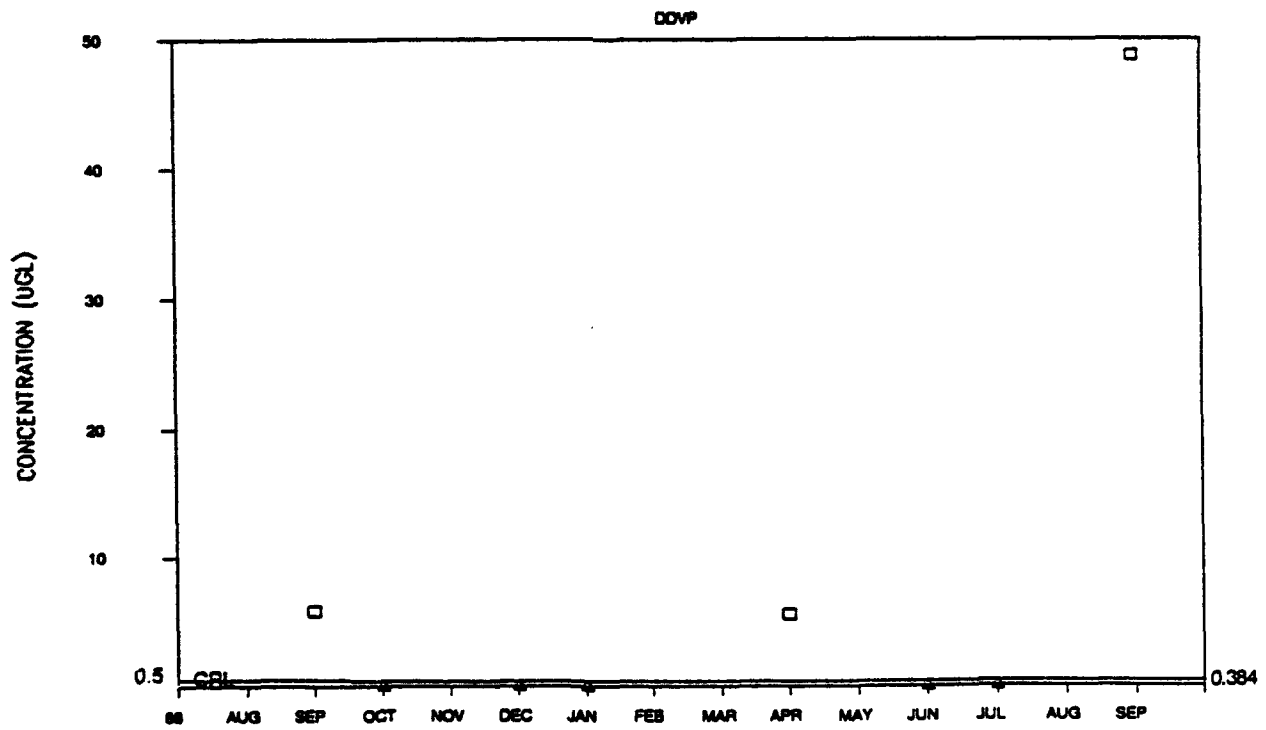


Figure 17. Vapona (Concluded)

Diisopropylmethylphosphonate

36. The CRL for diisopropylmethylphosphonate (DIMP) ranged from 0.65 ug/l to 0.392 ug/l as indicated in Figure 18. All of the samples collected from the system influent were found to contain DIMP above the CRL. The maximum concentration found was approximately 87 ug/l. The average concentration over the study period was 45.23 ug/l. Four of the samples collected from the carbon/alumina effluent had DIMP concentration above the CRL with a maximum concentration of approximately 12 ug/l found in December, 1988. Approximately half of the samples collected from the air stripper effluent had DIMP concentrations in excess of the CRL with a maximum concentration of approximately 11 ug/l in the sample collected in August, 1989. These results indicate that DIMP was a common contaminant in the influent to the CPS and that the treatment system removed significant amounts of DIMP although it was not able to achieve removals to below the CRL on a continuous basis.

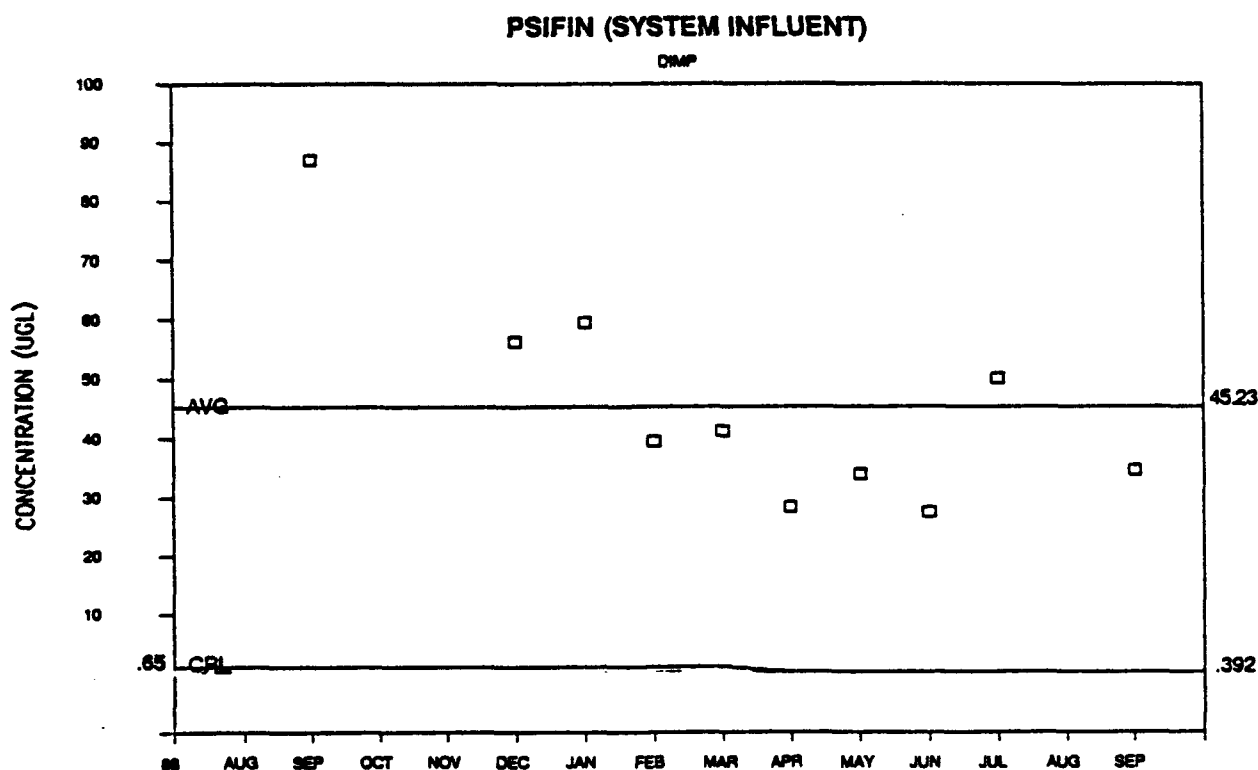


Figure 18. Diisopropylmethylphosphonate Concentrations (Continued)

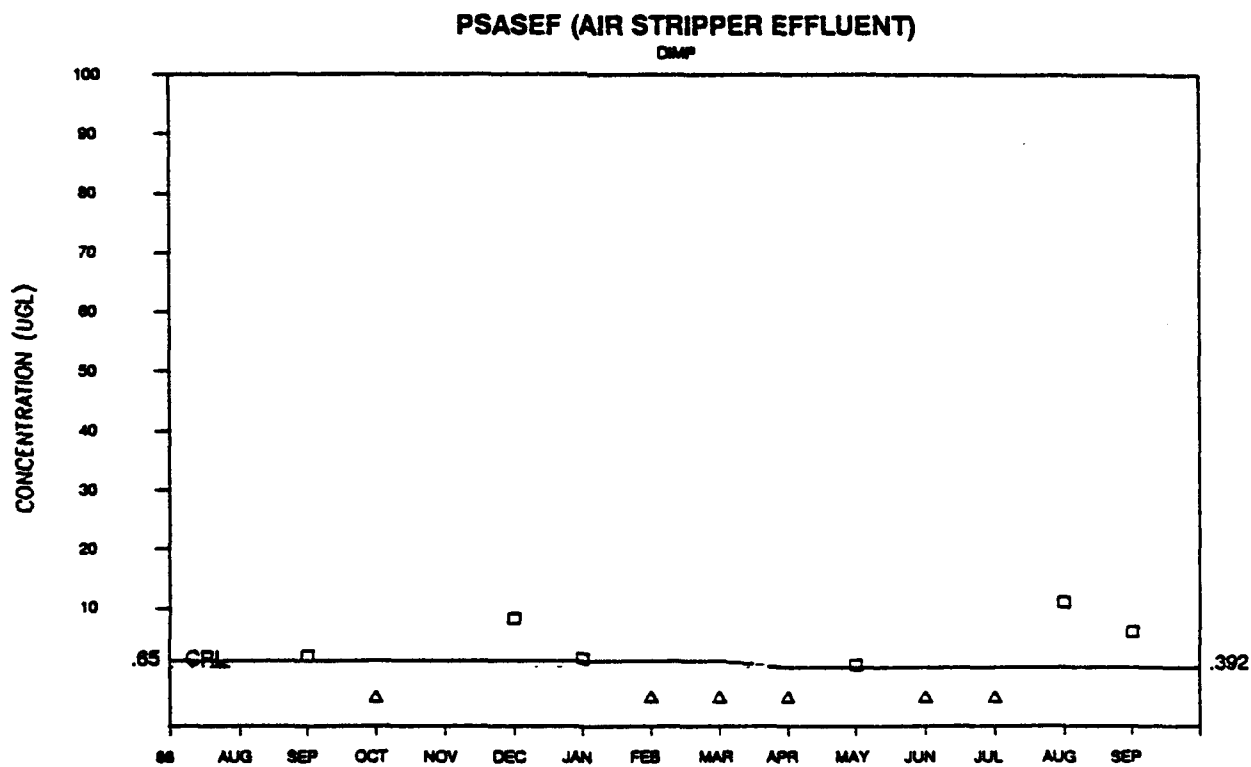
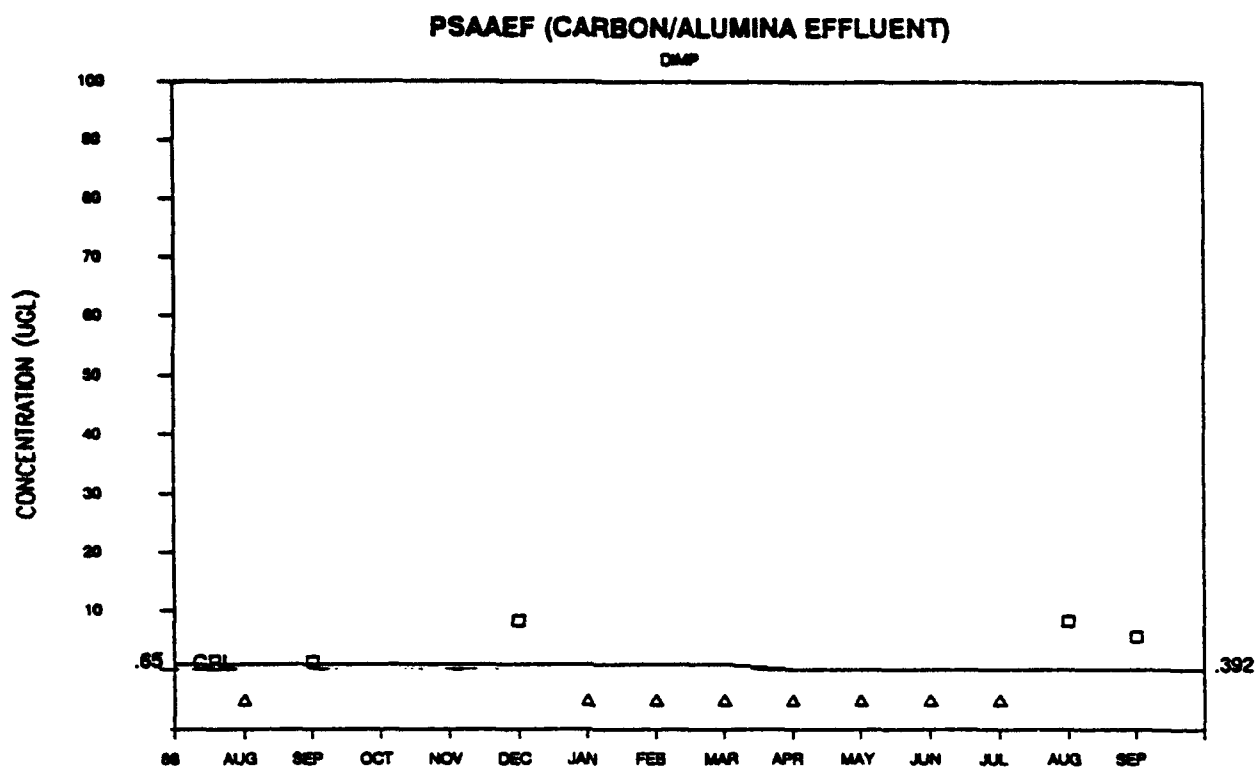


Figure 18. Diisopropylmethylphosphonate (Concluded)

Dithiane

37. The CRL for dithiane (DITH) was 1.34 ug/l as indicated in Figure 19. Concentrations of dithiane above the CRL were found in system influent samples in August and September, 1988, and June and July, 1989. The maximum concentration found was approximately 13.8 ug/l. None of the samples collected from the carbon/alumina or air stripper effluent had concentrations of dithiane in excess of the CRL. These results indicate that dithiane was present in less than half of the samples collected from the influent to the CPS and that the treatment system effectively removed it.

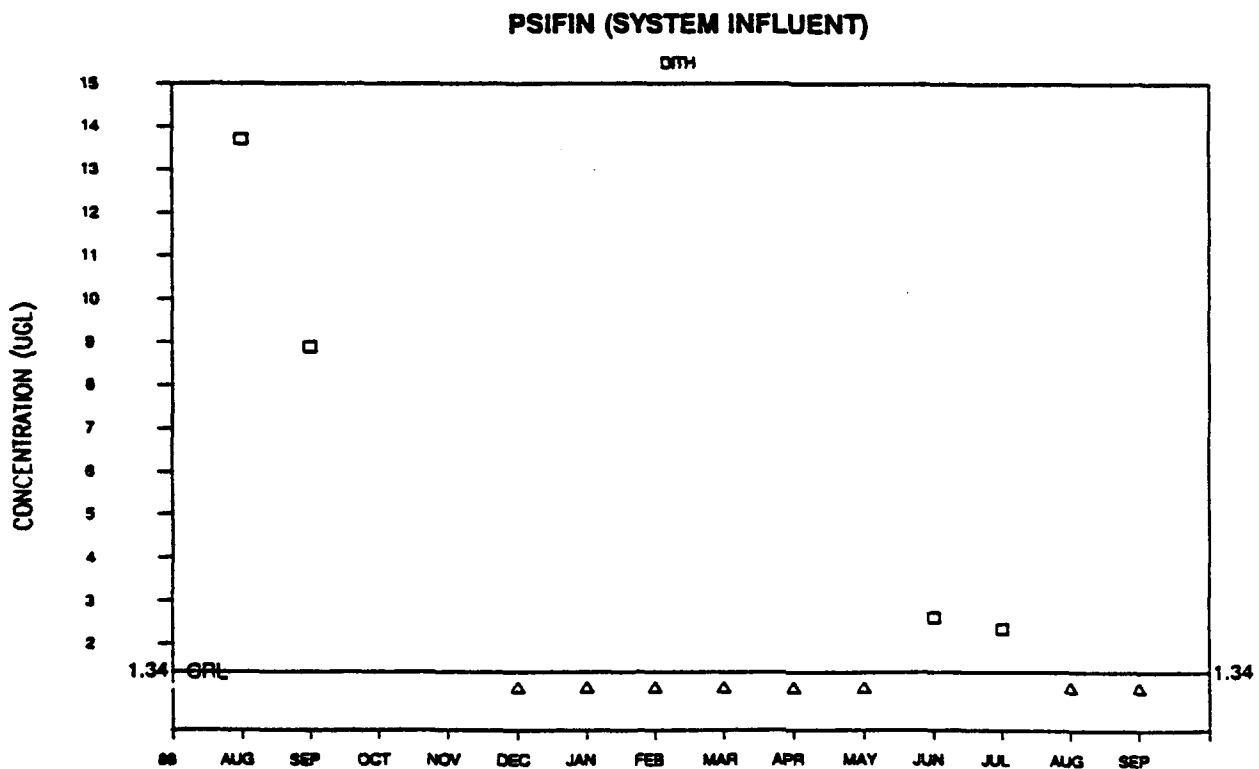


Figure 19. Dithiane Concentrations (Continued)

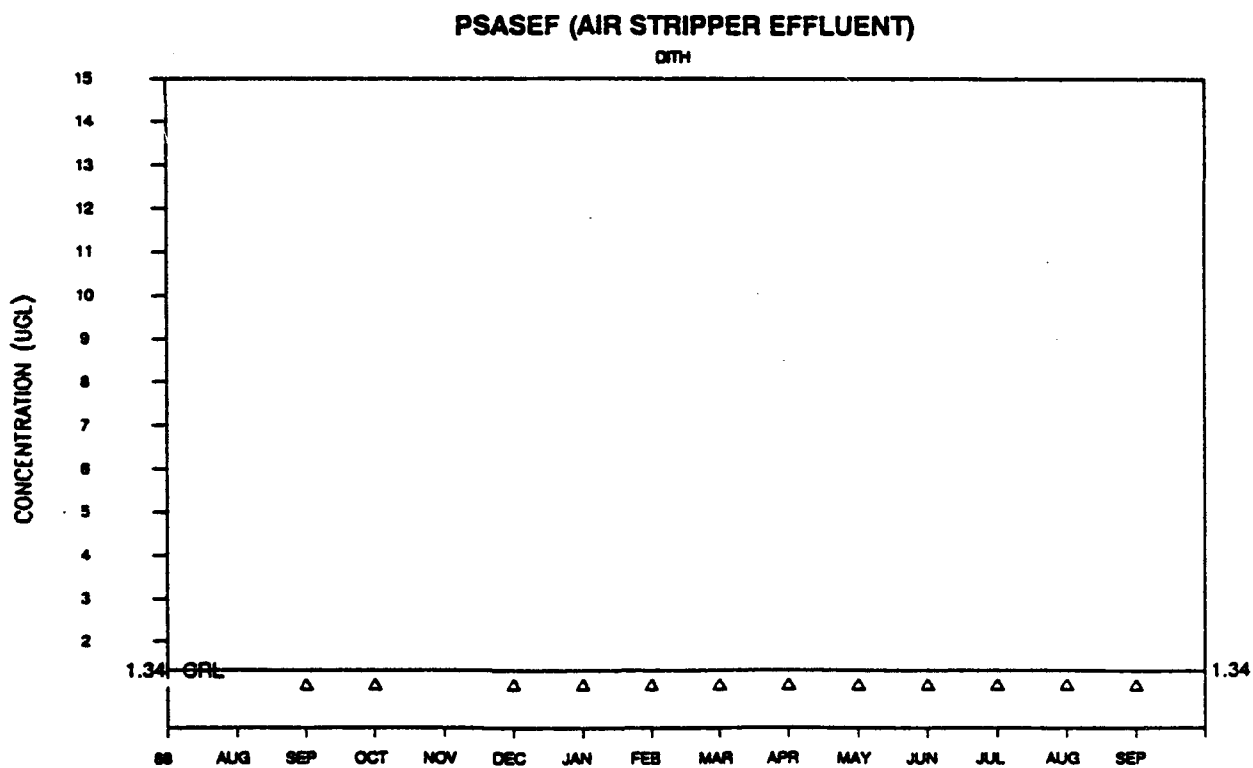
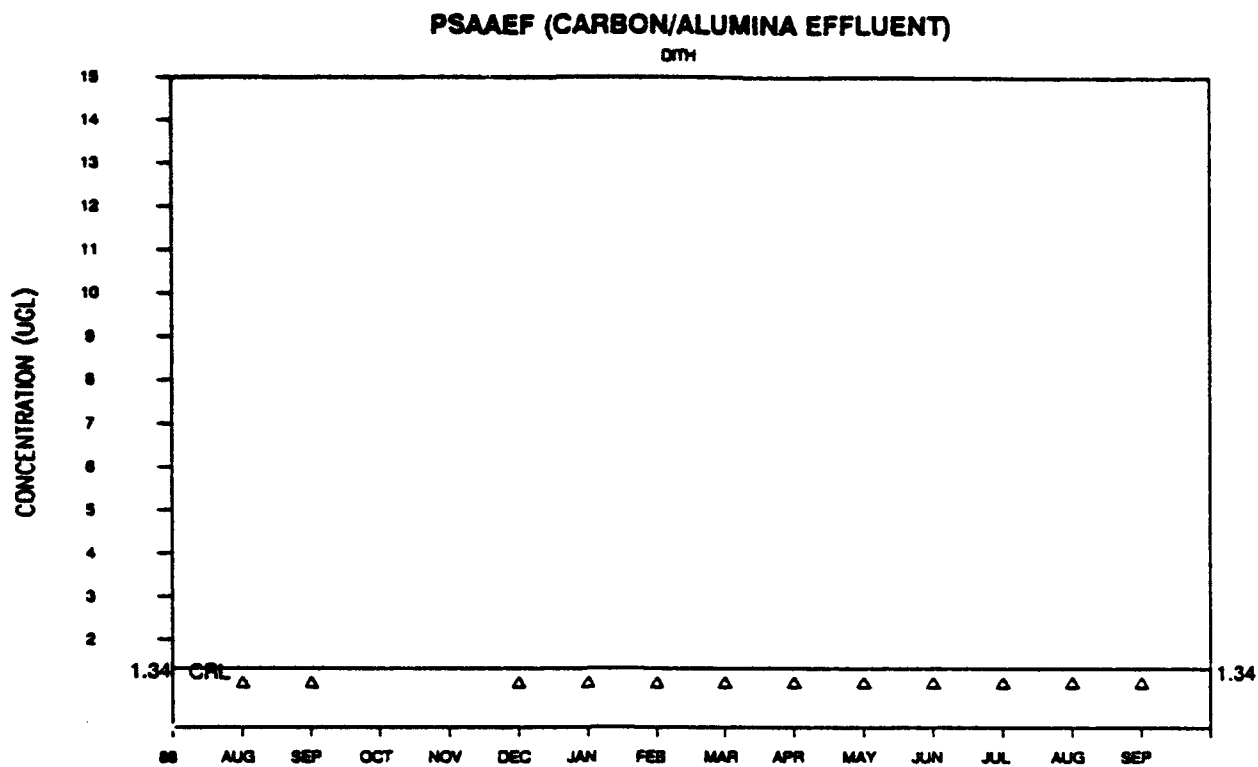


Figure 19. Dithiane (Concluded)

Dieldrin

38. The CRL for dieldrin (DLDRN) was 0.05 ug/l as indicated in Figure 20. All of the system influent samples collected during the study period contained concentrations of dieldrin above the CRL. The maximum concentration found was approximately 0.45 ug/l. Two samples collected from the carbon/alumina effluent in September, 1988, and January, 1989, and three samples from the air stripper effluent in February 1988, and in July, and August, 1989, had concentrations of dieldrin above the CRL. The maximum concentration found in the air stripper effluent was approximately 0.5 ug/l. These results indicate that dieldrin was a common contaminant in the influent to the CPS and that the treatment system was generally effective in removing it to below the CRL.

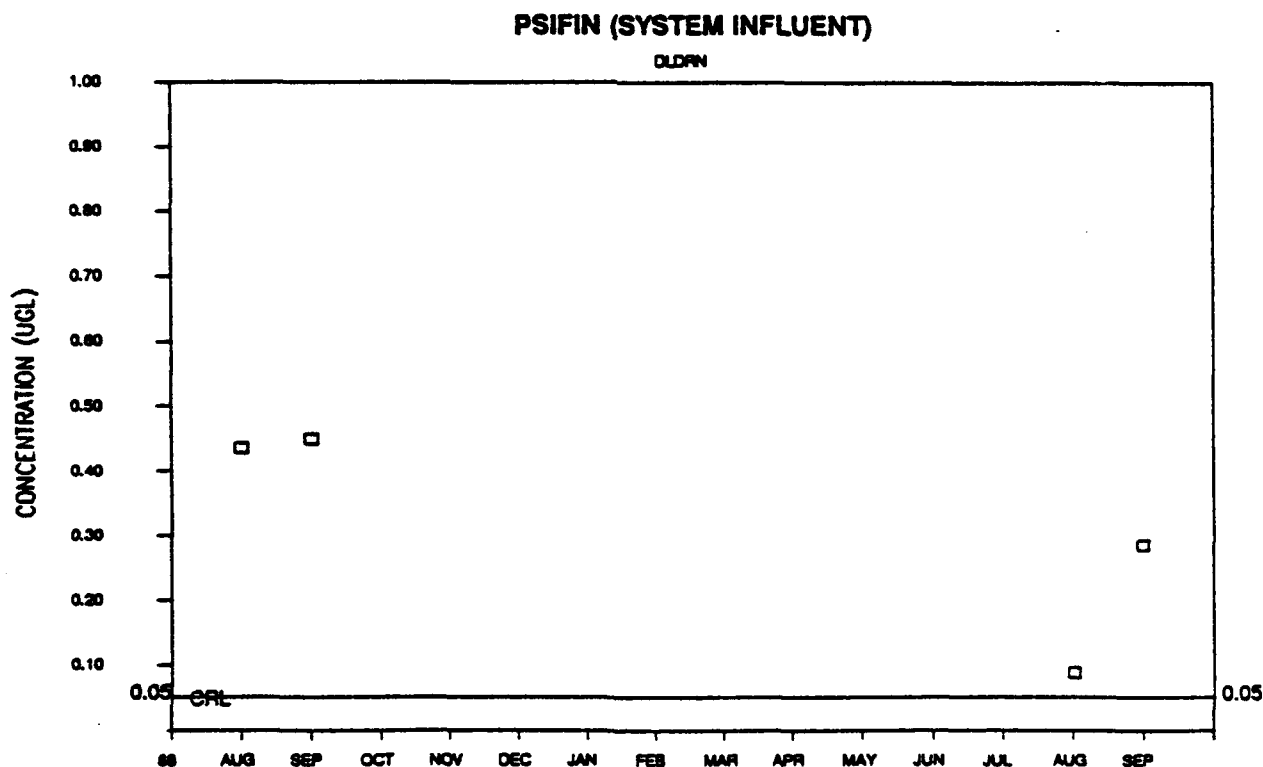


Figure 20. Dieldrin Concentration (Continued)

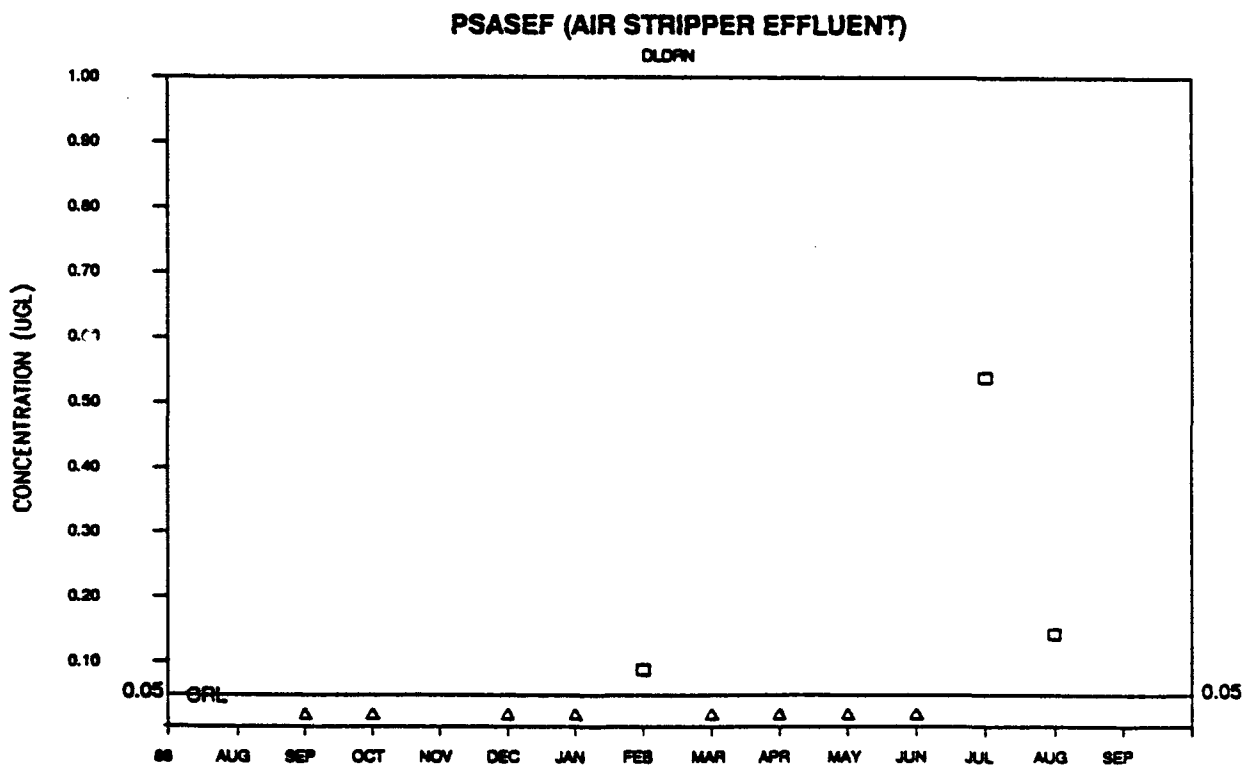
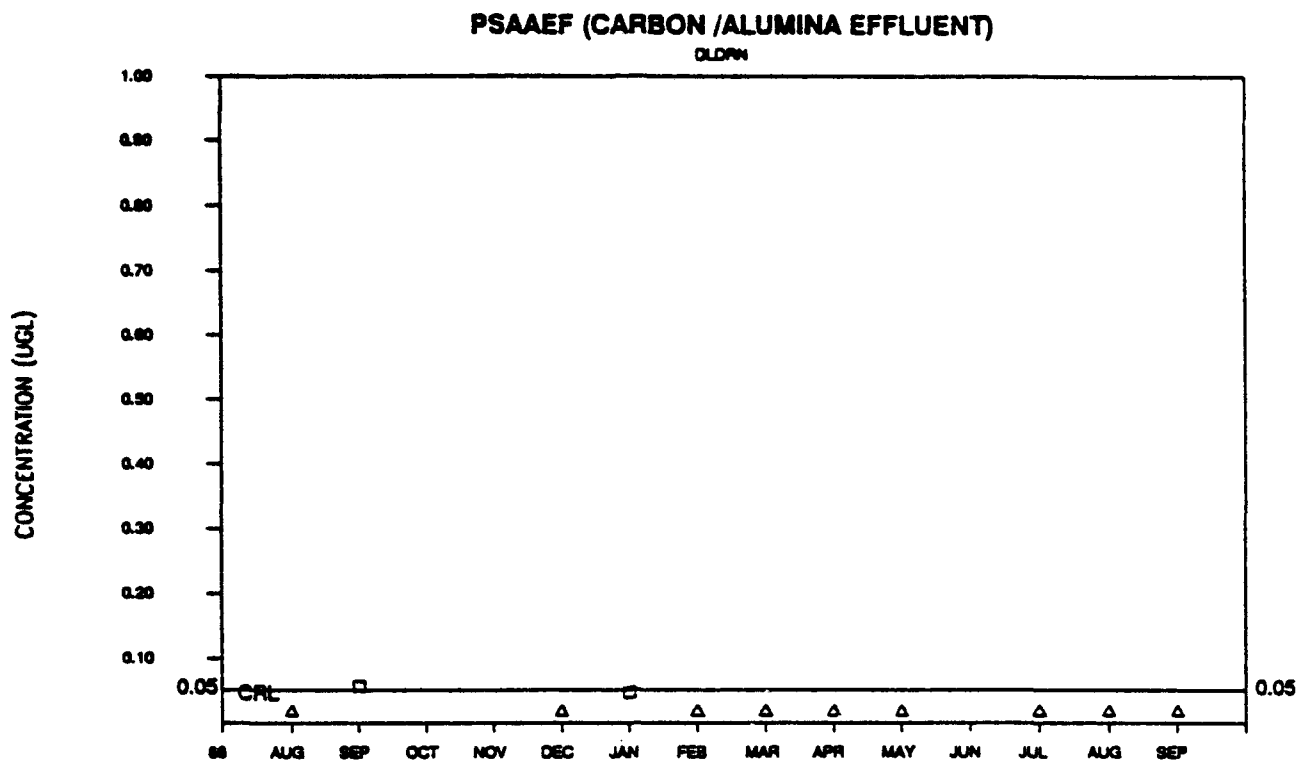


Figure 20. Dieldrin (Concluded)

Dimethyldisulfide

39. As indicated in Figure 21, the CRL for dimethyldisulfide (DMDS) was 0.55 ug/l. None of the samples collected from the system influent or carbon/alumina effluent contained dimethyldisulfide concentrations in excess of the CRL. One sample collected from the air stripper effluent in February, 1989, had a dimethyldisulfide concentration in excess of the CRL at approximately 1 ug/l. Thus, dimethyldisulfide was not a contaminant of much significance for the CPS during the study period.

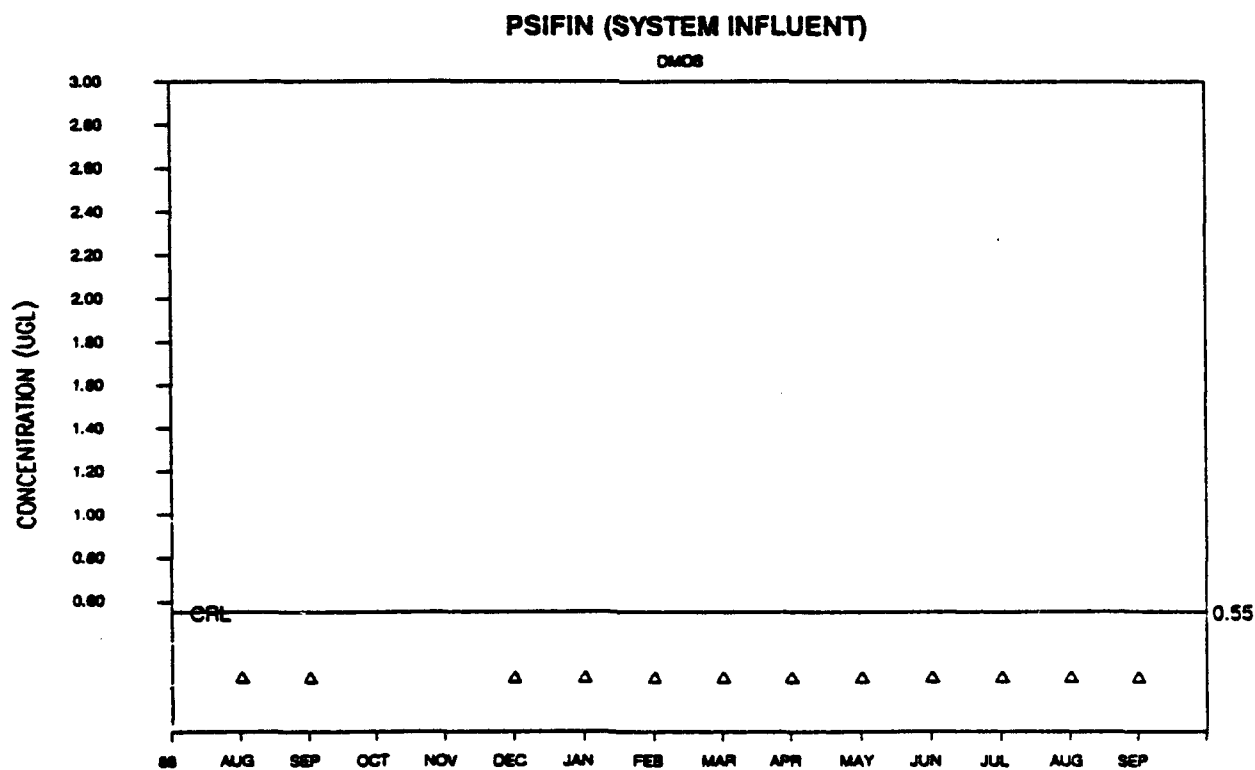


Figure 21. Dimethyldisulfide Concentrations (Continued)

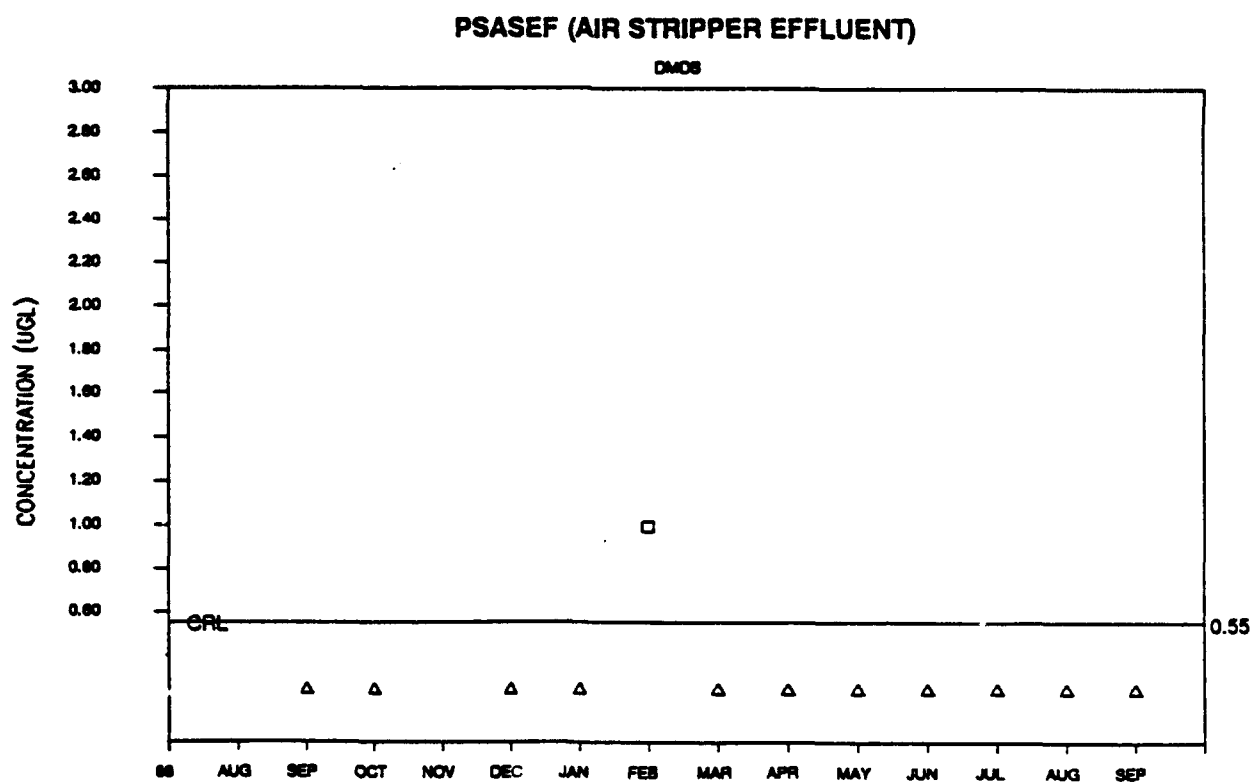
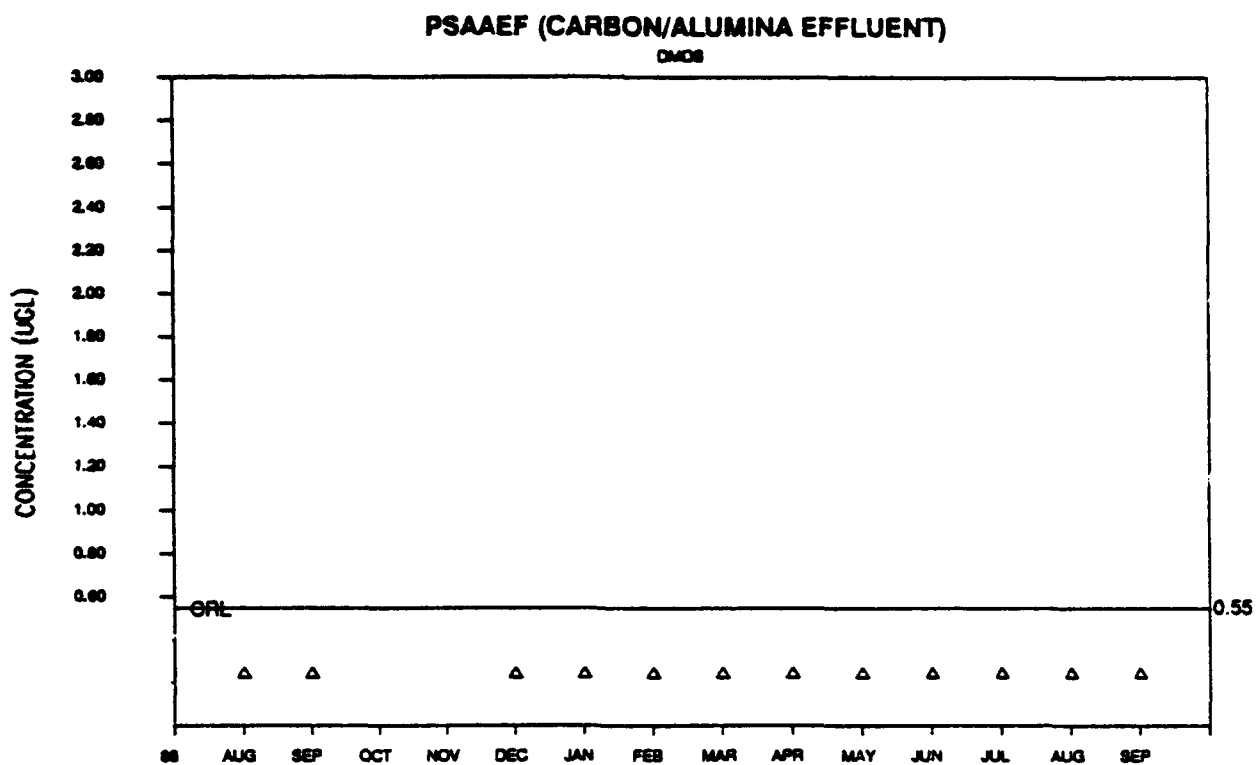


Figure 21. Dimethyldisulfide (Concluded)

Dimethylmethylphosphonate

40. The CRL for dimethylmethylphosphonate (DMMP) was 0.188 as indicated in Figure 22. Only samples collected after April, 1989, were analyzed for DMMP. All the samples collected from the system influent contained DMMP in concentrations in excess of the CRL. The maximum concentration found was approximately 18 ug/l with an average of 6.56 ug/l. Three of the samples collected from the carbon/alumina effluent had DMMP concentrations above the CRL with a maximum concentration of approximately 13 ug/l found in September, 1989. Four of the samples collected from the air stripper effluent had DMMP concentrations in excess of the CRL with a maximum concentration of approximately 15 ug/l found in September, 1989. These results indicate that DMMP was a common contaminant in the influent to the CPS and that the treatment system was not very effective in removing it to below the CRL.

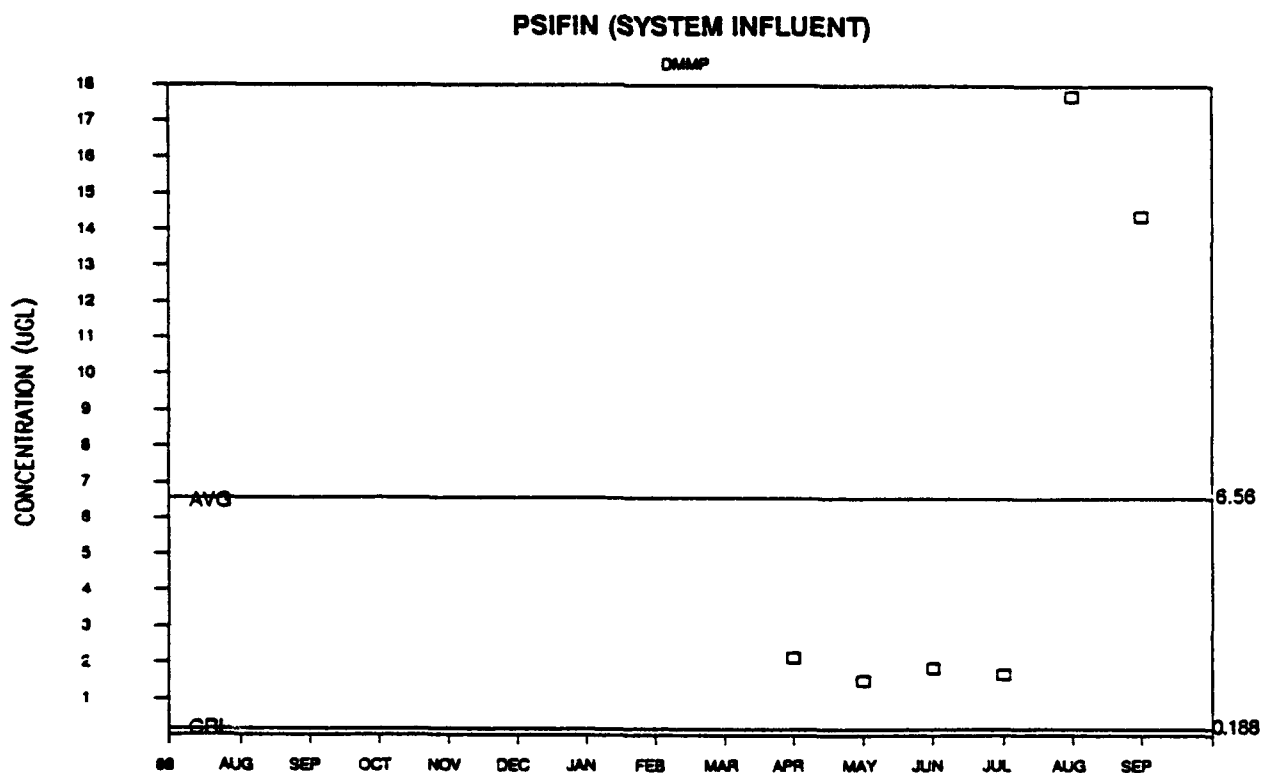
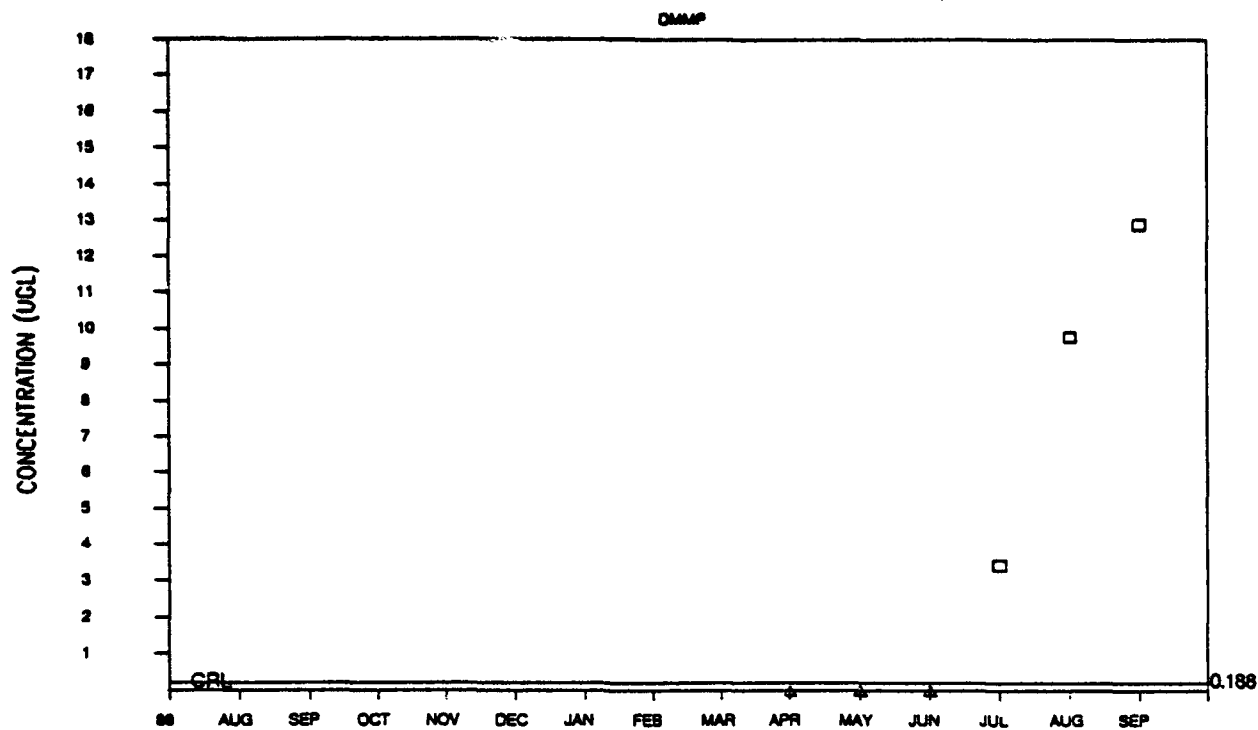


Figure 22. Dimethylmethylphosphonate Concentration (Continued)

PSAAEF (CARBON/ALUMINA EFFLUENT)



PSASEF (AIR STRIPPER EFFLUENT)

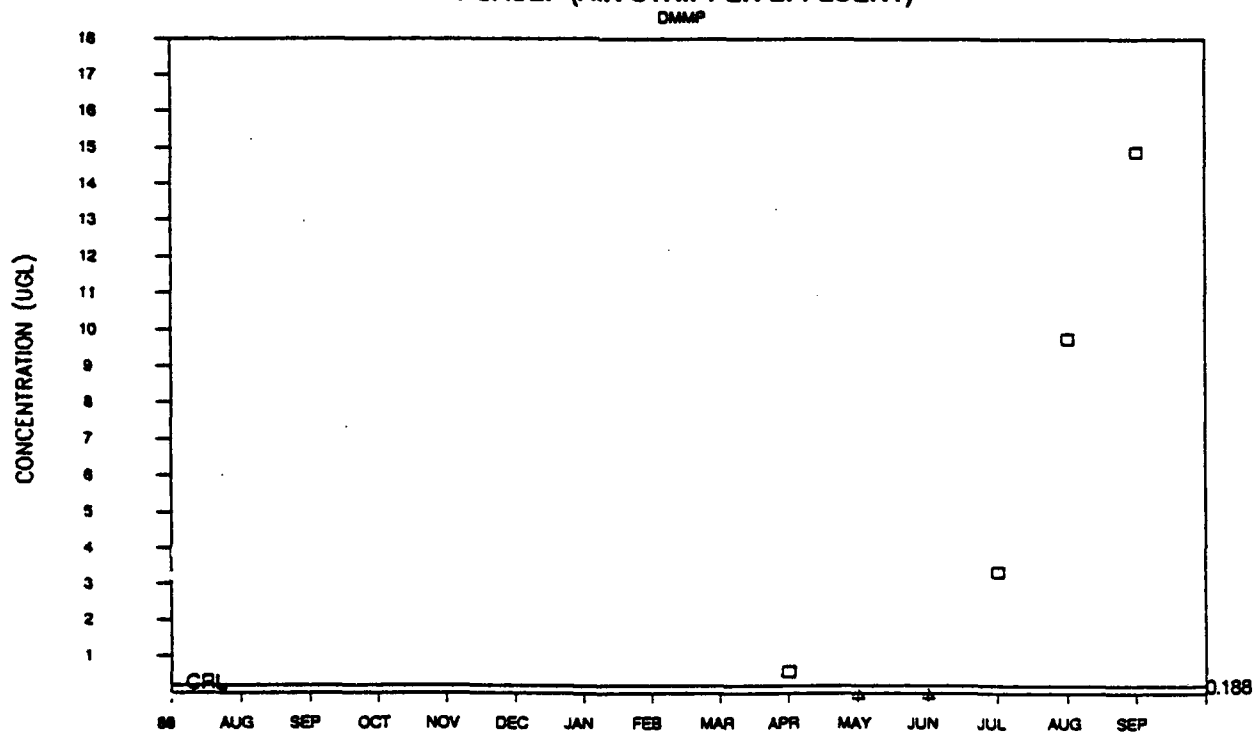


Figure 22. Dimethylmethylphosphonate (Concluded)

Endrin

41. The CRL for endrin (ENDRN) was 0.05 ug/l as indicated in Figure 23. All of the system influent samples collected during the study period contained concentrations of endrin above the CRL. The maximum concentration found was approximately 0.4 ug/l with an average concentration over the study period of 0.28 ug/l. A concentration of endrin greater than the CRL was found in one sample collected from carbon/alumina effluent. Three samples from the air stripper effluent had endrin concentration in excess of the CRL with a maximum of approximately 0.7 ug/l found in the August, 1989, sample. The results of the endrin analyses indicate that endrin was a common contaminant in the influent to the CPS and that the treatment system was generally effective in removing it.

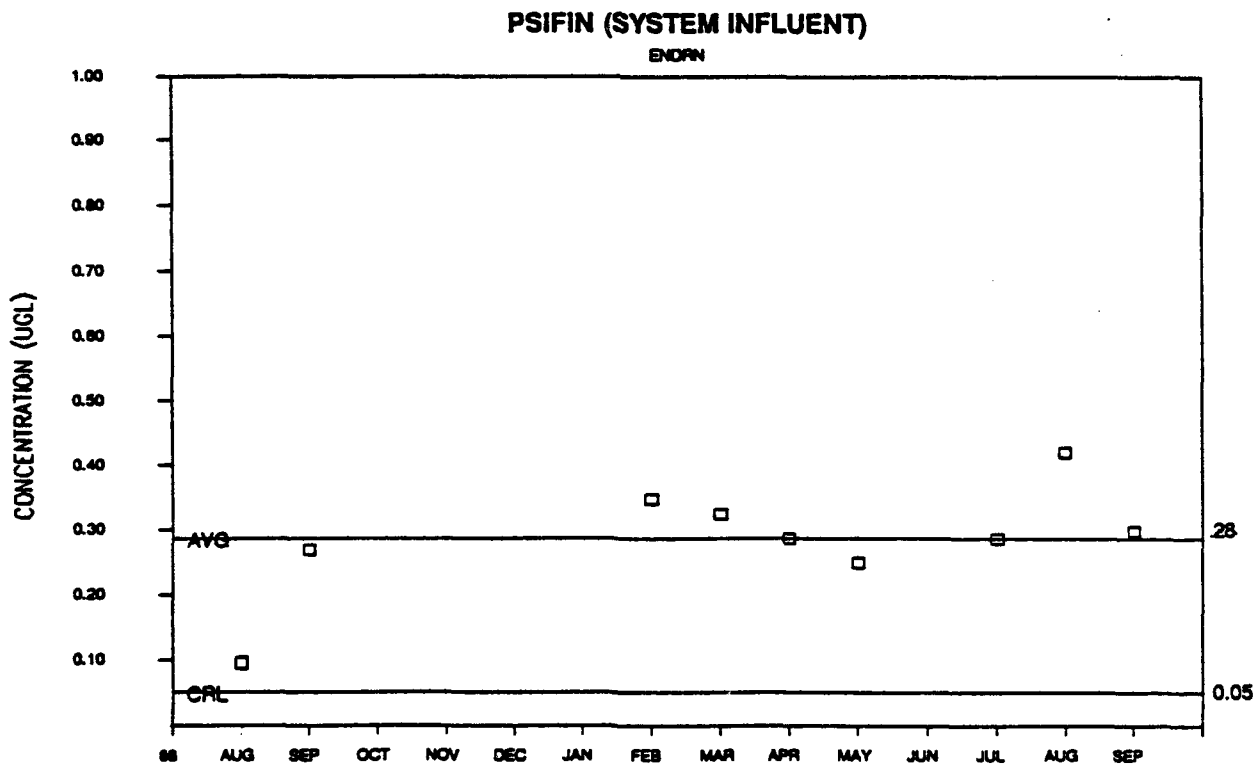


Figure 23. Endrin Concentrations (Continued)

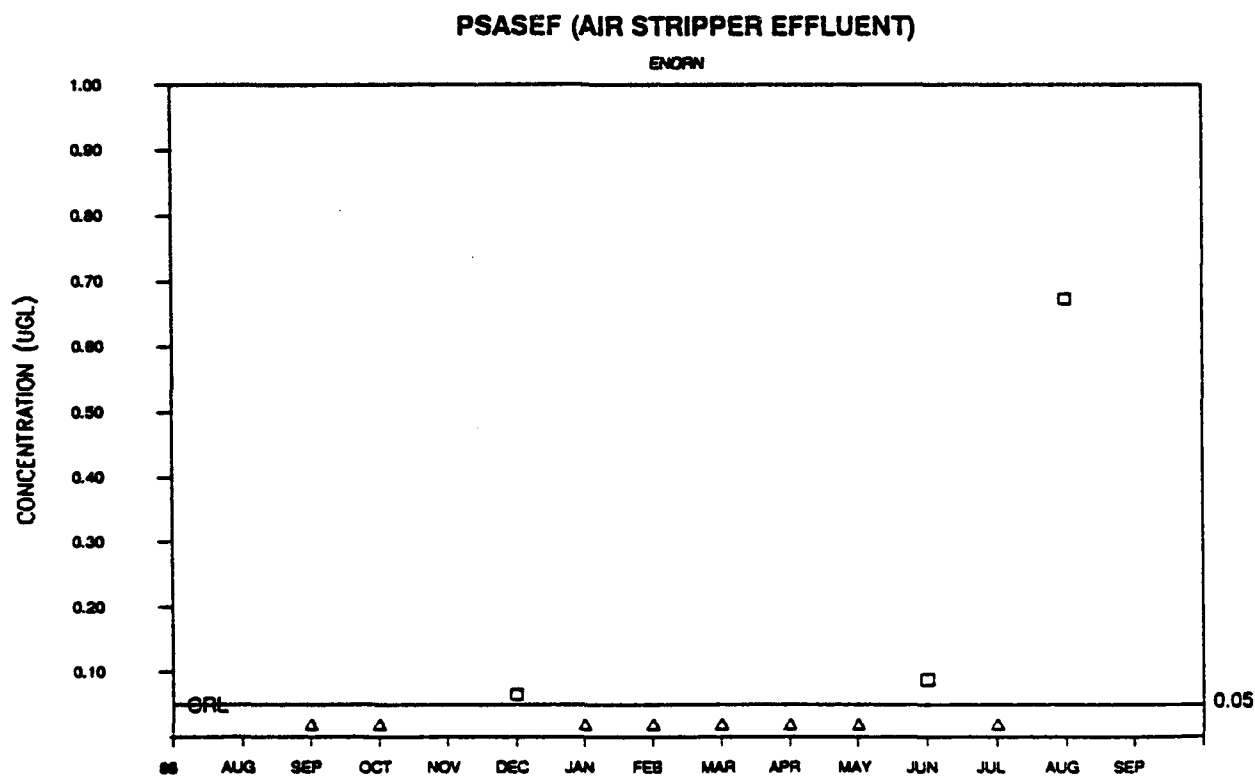
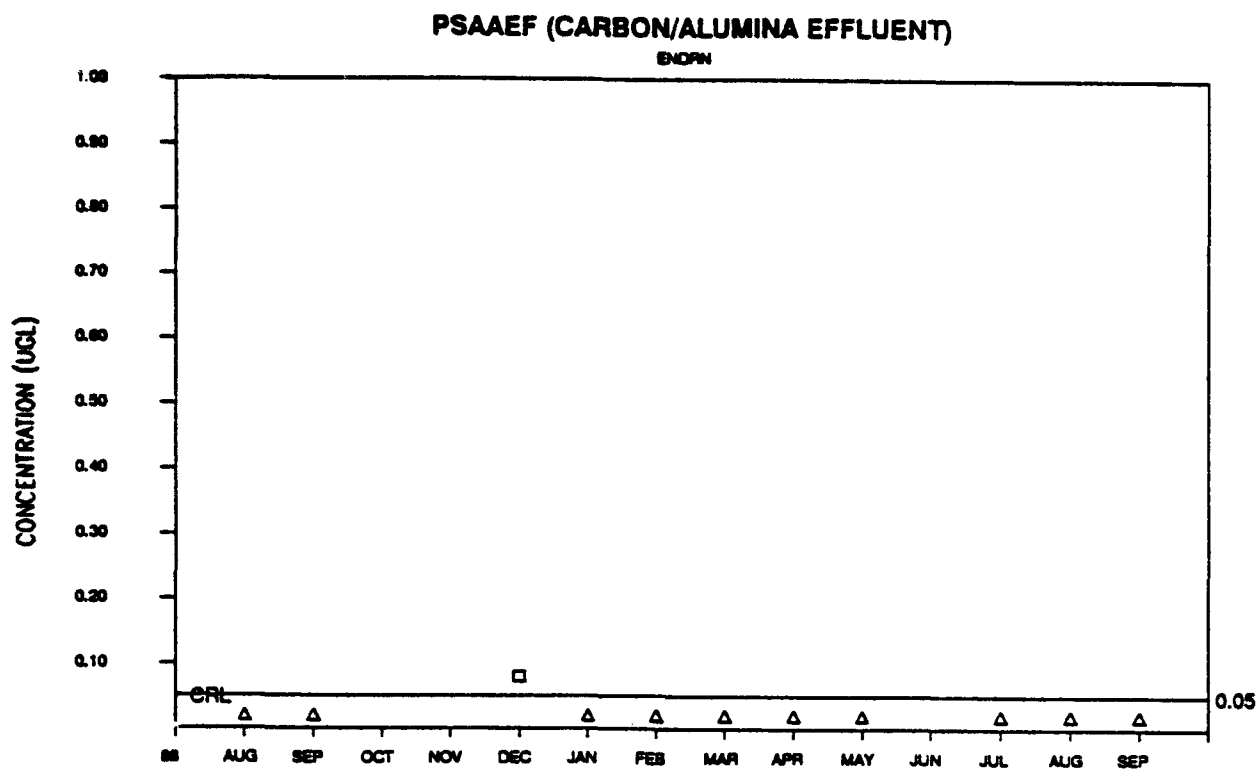


Figure 23. Endrin (Concluded)

Ethyl benzene

42. The CRL for ethyl benzene (ETC6H5) was 1.37 ug/l as indicated in Figure 24. One sample collected from the system influent in January, 1989, had an ethyl benzene concentration in excess of the CRL at approximately 2.25 ug/l. None of the samples collected from the carbon/alumina or air stripper effluents contained ethyl benzene concentrations above the CRL. Thus, ethyl benzene was not a contaminant of much significance for the CPS during the study period.

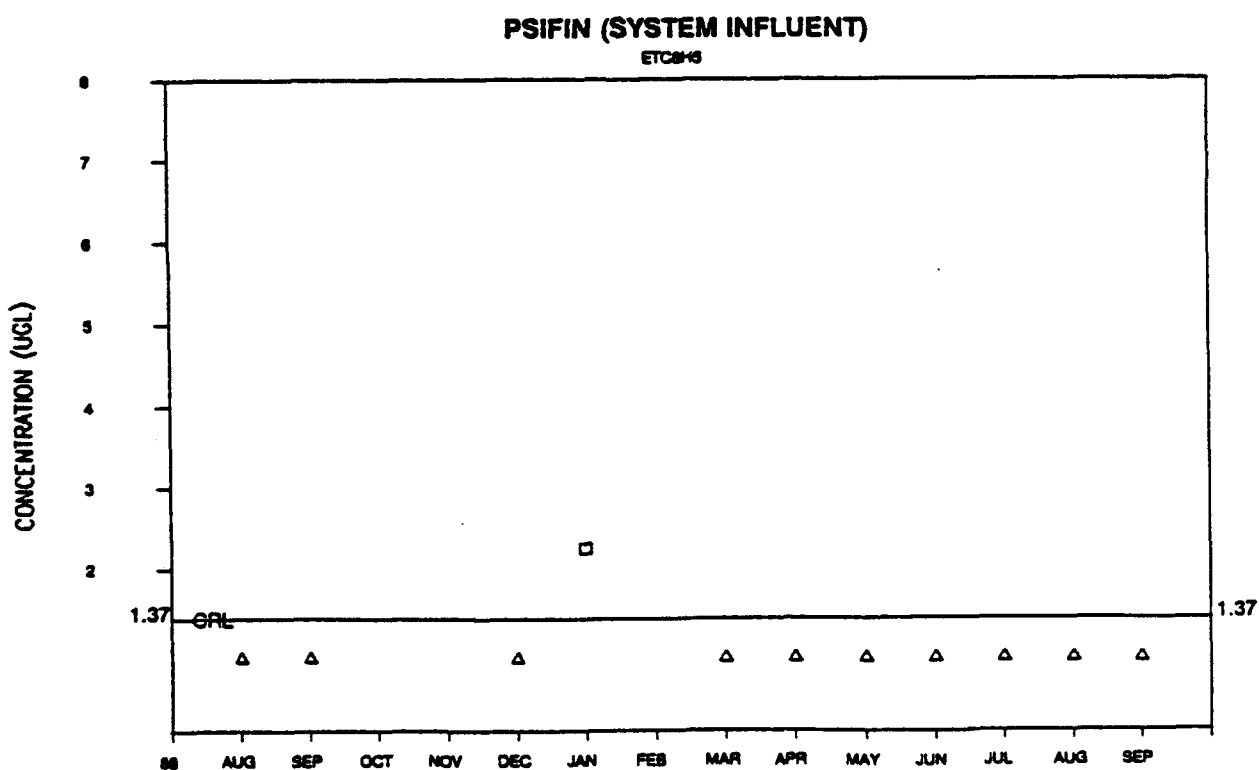


Figure 24. Ethyl Benzene Concentrations (Continued)

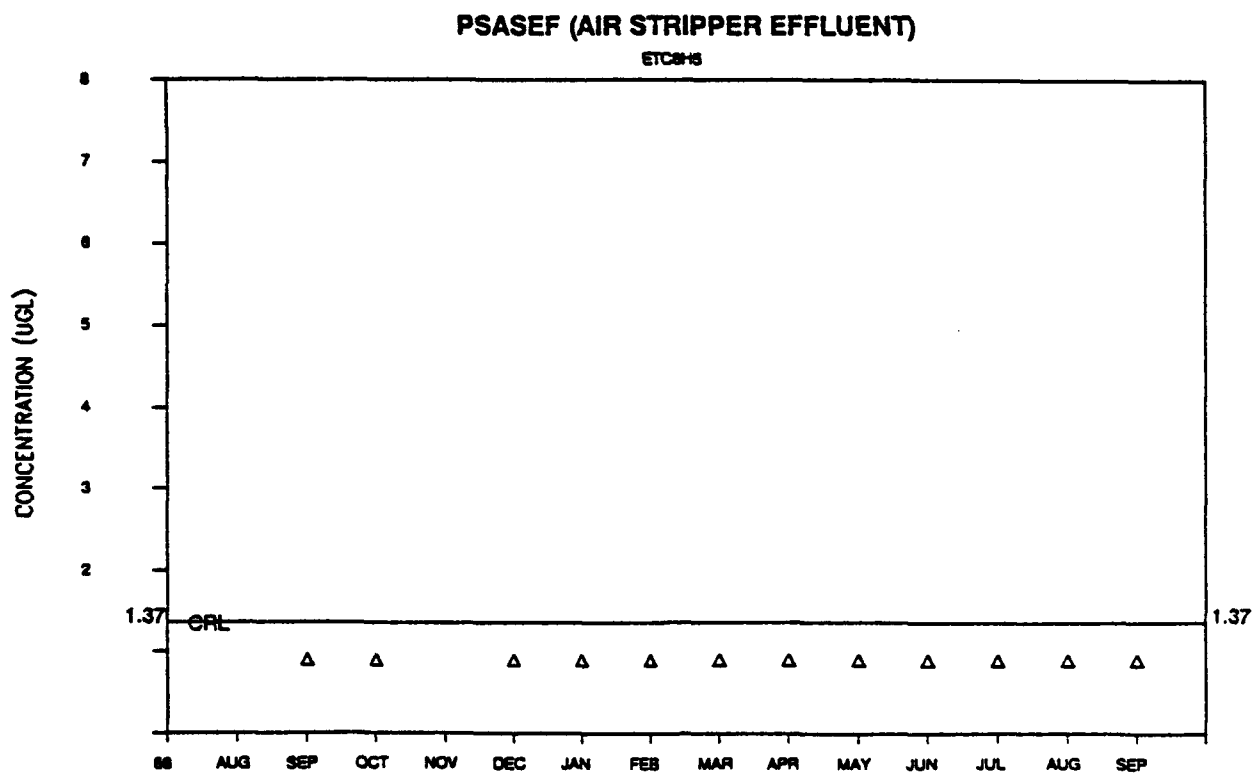
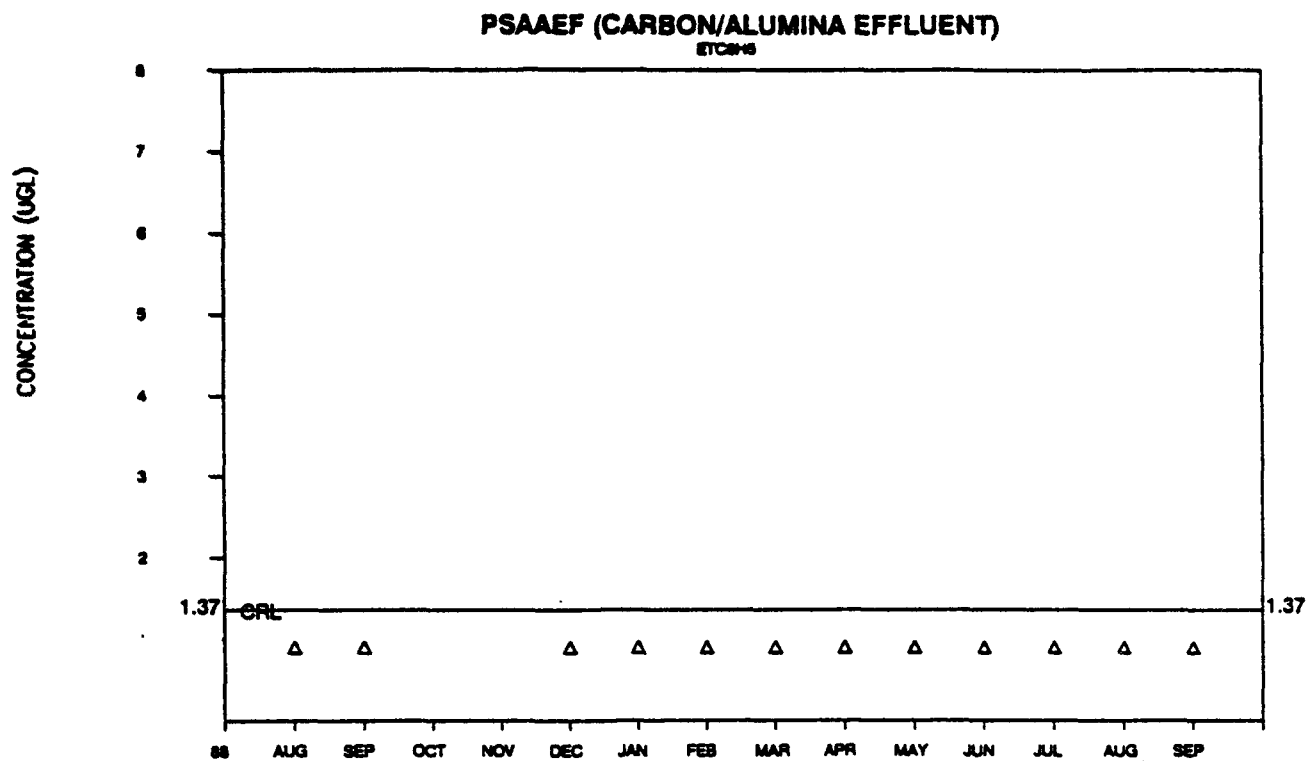


Figure 24. Ethyl Benzene (Concluded)

Fluoride

43. No CRL was reported for fluoride. The average fluoride concentrations over the study period in the system influent, carbon/alumina effluent, and air stripper effluent were 1.7 mg/l, 1.5 mg/l, and 1.5 mg/l, respectively as shown in Figure 25. The maximum fluoride concentration found in the system influent was approximately 3.2 mg/l. The maximum concentration found in the air stripper effluent was approximately 2.5 mg/l. These data indicate that the alumina treatment system was only slightly effective in removing fluoride.

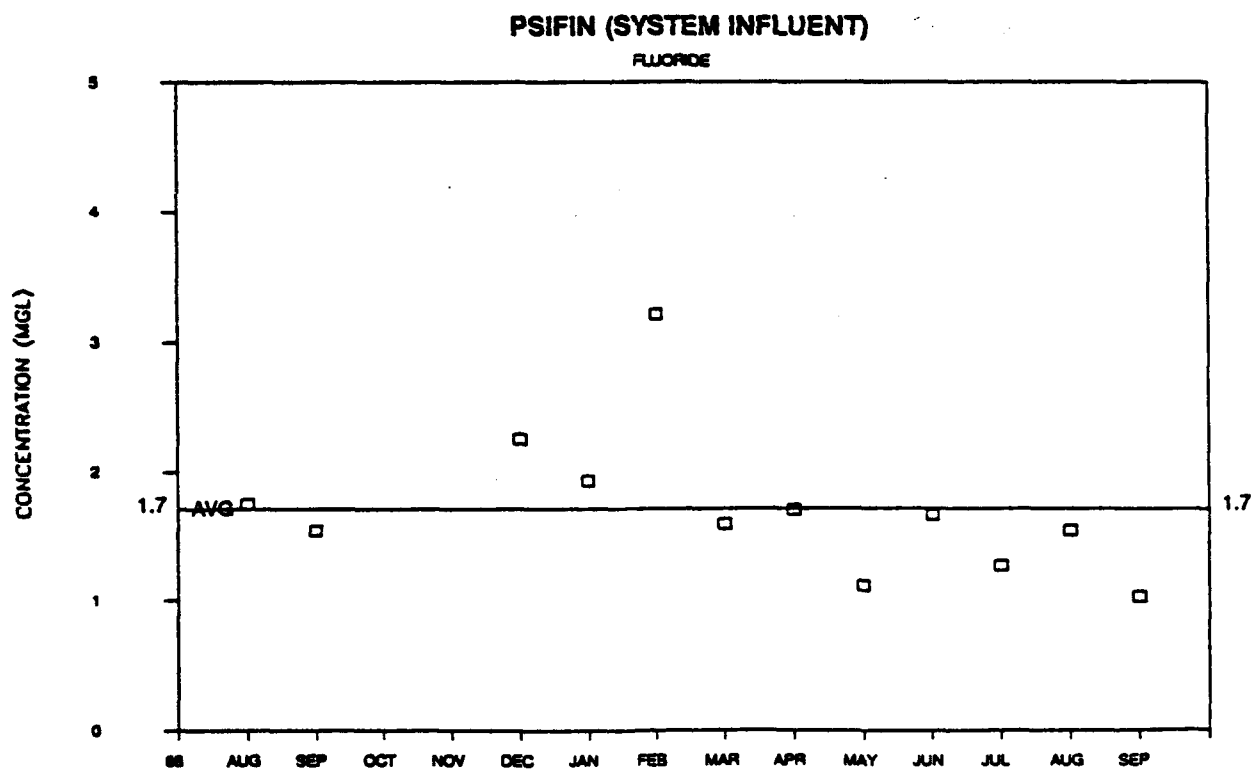


Figure 25. Fluoride concentrations (Continued)

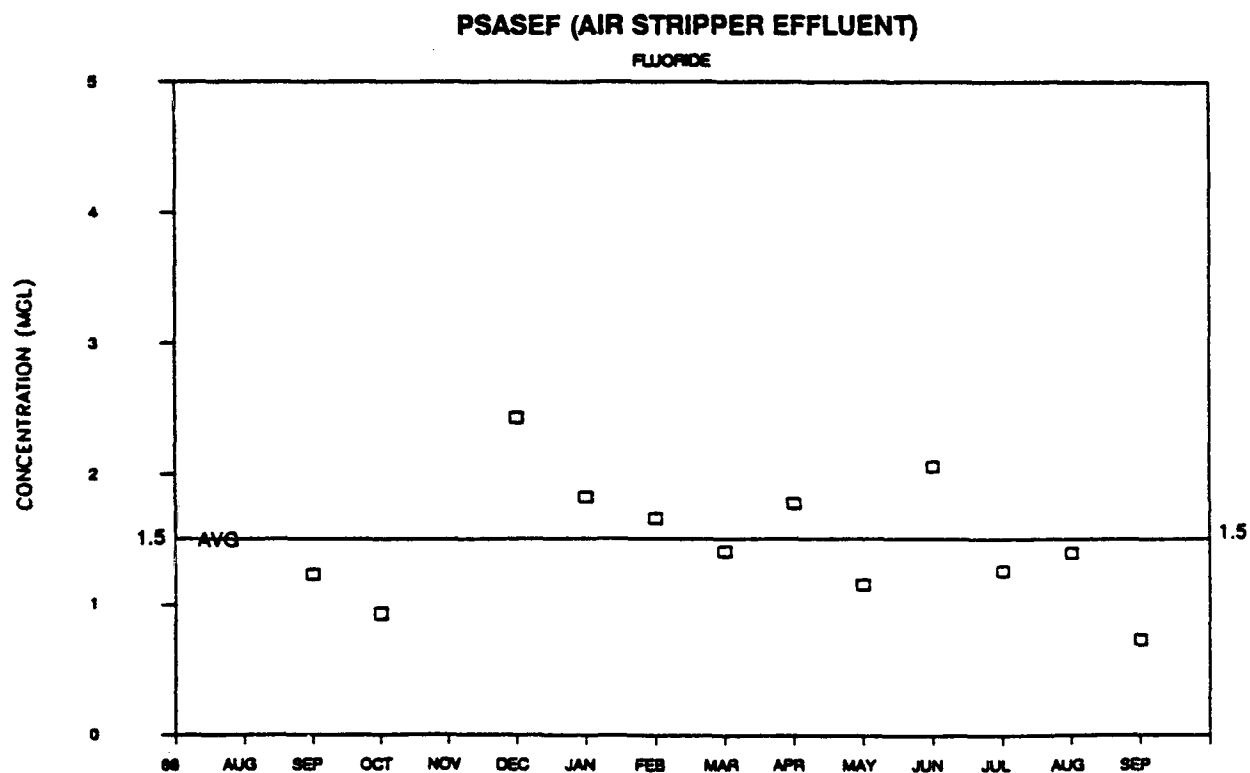
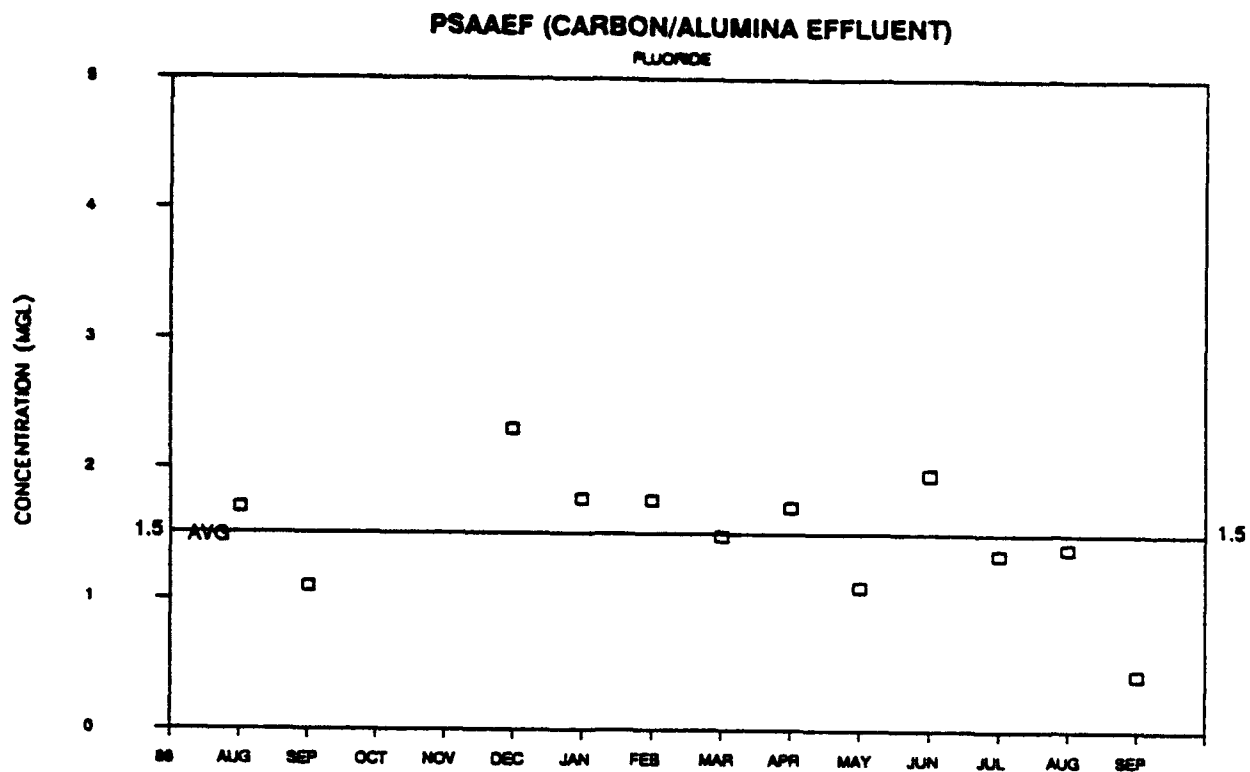


Figure 25. Fluoride (Concluded)

Isodrin

44. The CRL for isodrin (ISODR) was 0.051 ug/l as indicated in Figure 26. A majority of the samples collected from the system influent were found to contain isodrin above the CRL. The maximum concentration found was approximately 0.4 ug/l. None of the samples collected from the carbon/alumina or the air stripper effluents had isodrin concentrations above the CRL. These results indicate that isodrin was a common contaminant in the CPS influent during the study period and that the treatment system was successful in removing it.

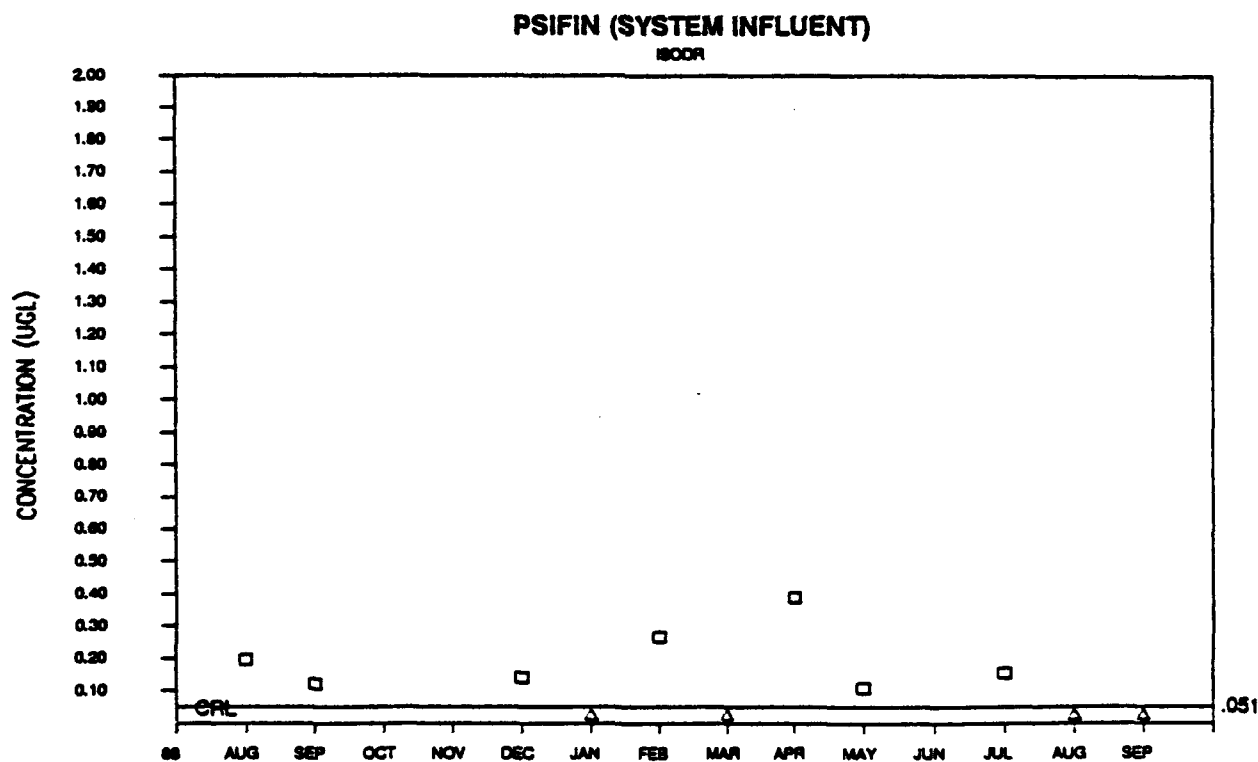
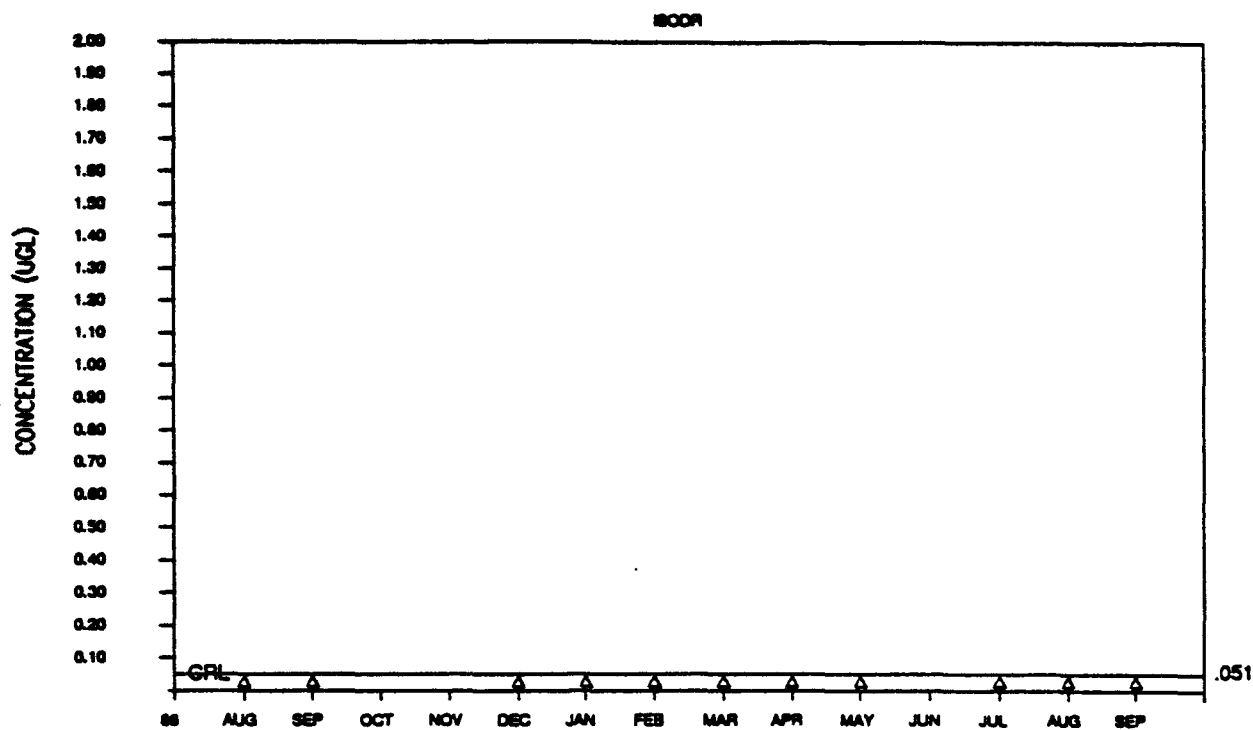


Figure 26. Isodrin Concentrations (Continued)

PSAAEF (CARBON/ALUMINA EFFLUENT)



PSASEF (AIR STRIPPER EFFLUENT)

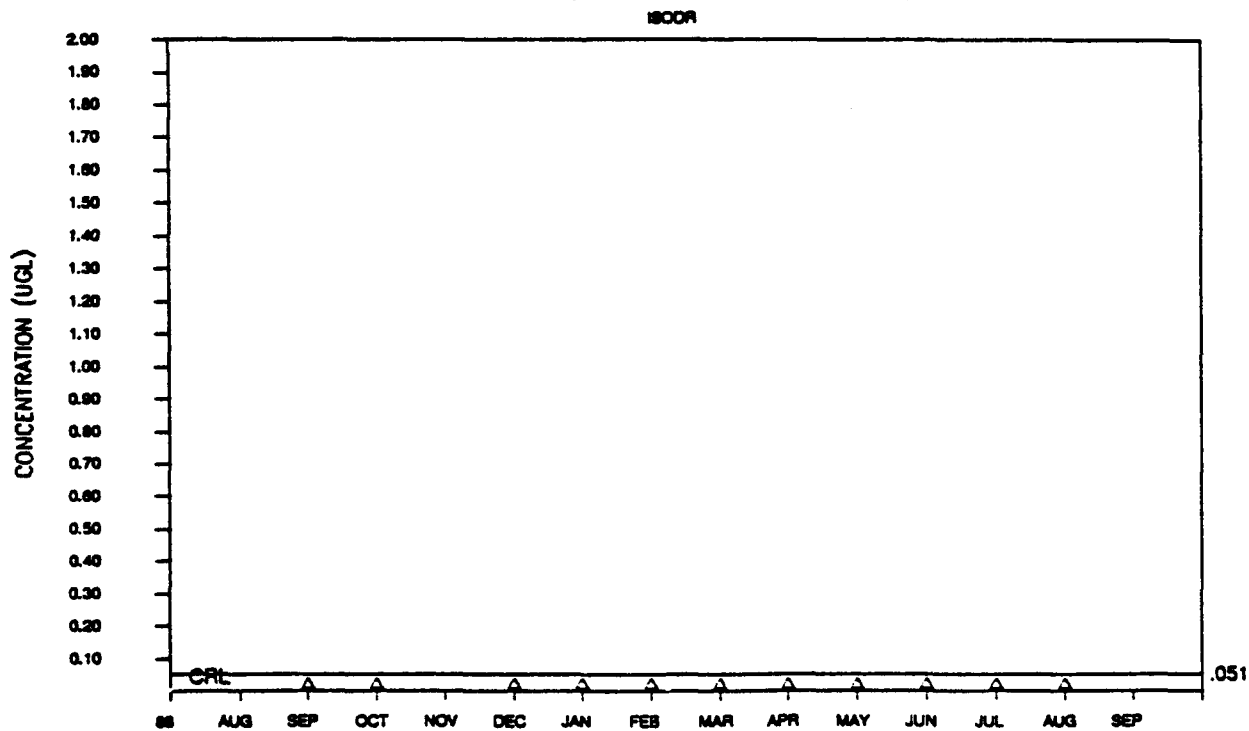


Figure 26. Isodrin (Concluded)

Toluene

45. As indicated in Figure 27, the CRL for toluene (MEC6H5) was 1.47 ug/l. Approximately half of the samples collected from the system influent were found to contain toluene in excess of the CRL. The maximum concentration found was approximately 13.5 ug/l. None of the samples collected from the carbon/alumina or air stripper effluents contained toluene concentrations above the CRL. In summary, toluene was found in approximately half of the system influent samples collected during the study period and the CPS successfully removed it.

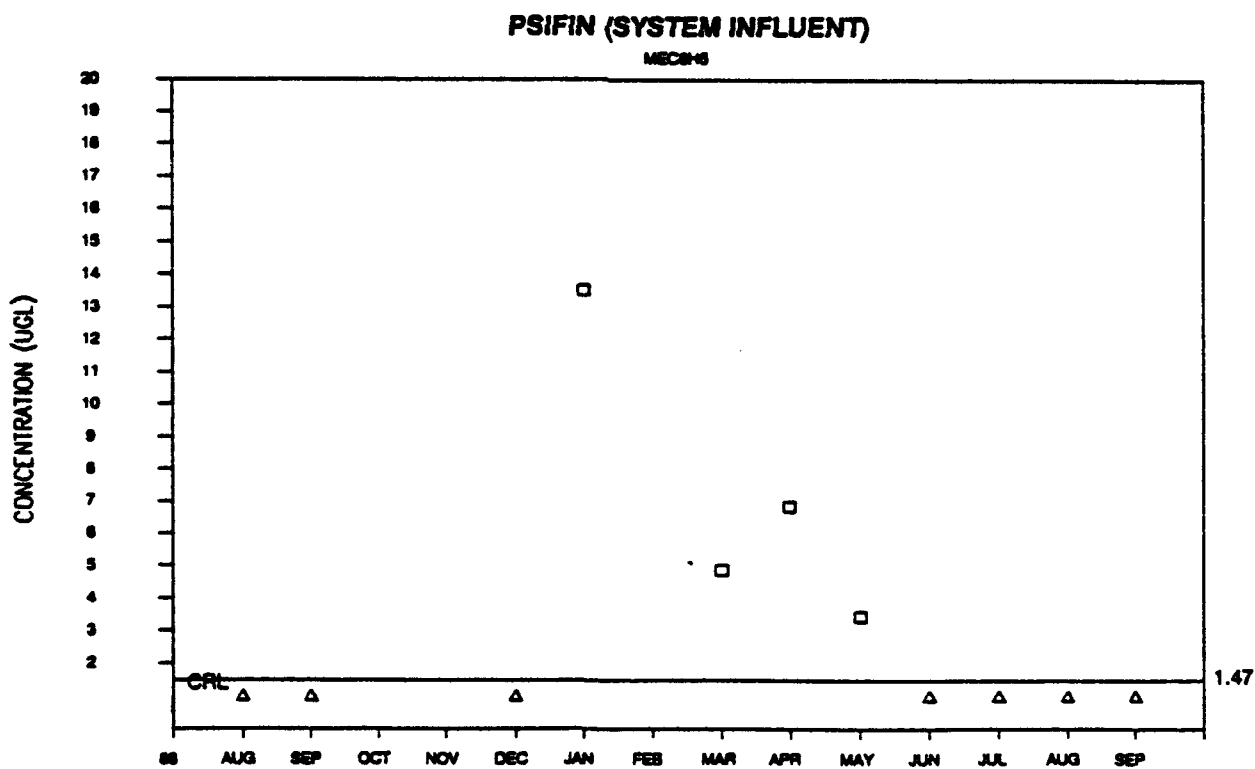
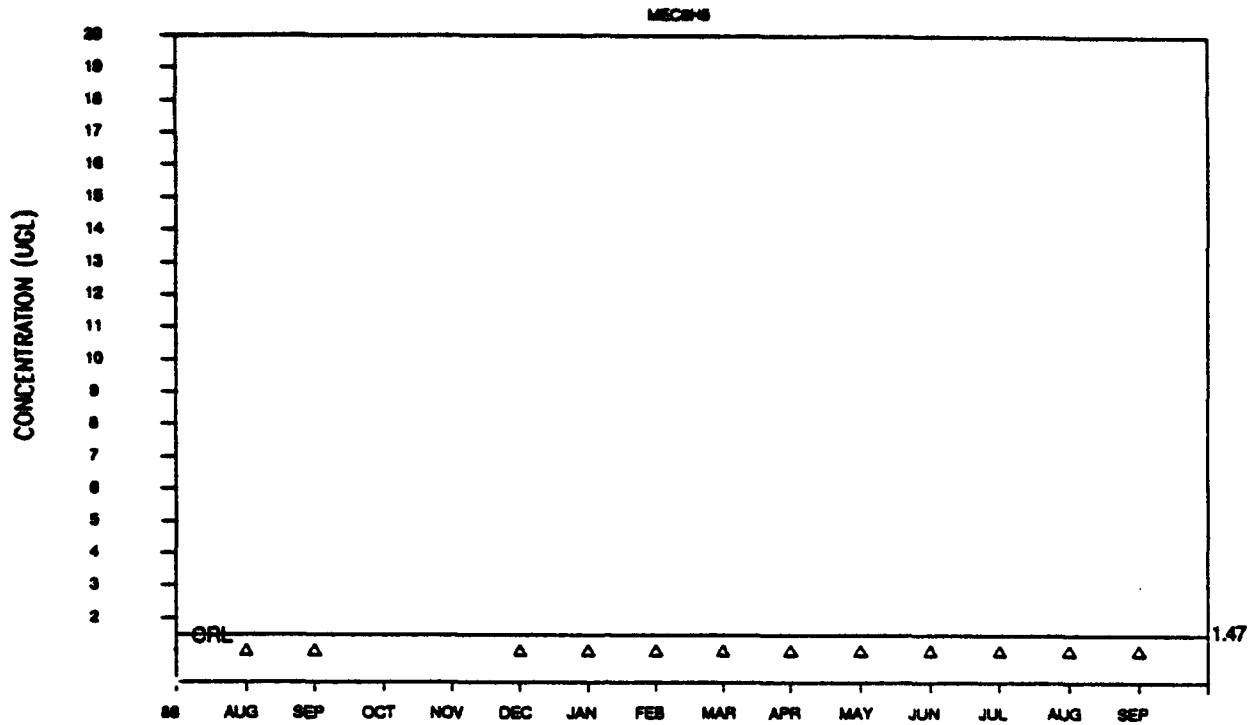


Figure 27. Toluene Concentrations (Continued)

PSAAEF (CARBON/ALUMIA EFFLUENT)



PSASEF (AIR STRIPPER EFFLUENT)

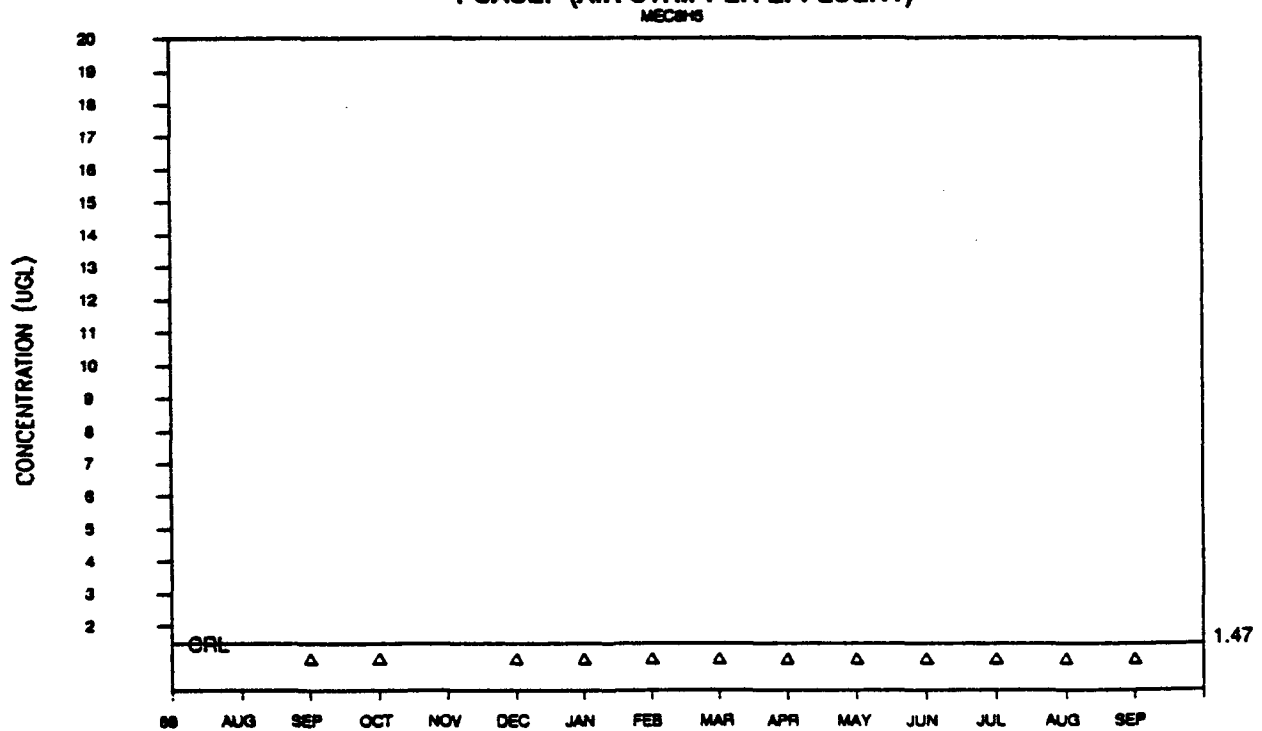


Figure 27. Toluene (Concluded)

Methylisobutylketone

46. The CRL for methylisobutylketone (MIBK) was 4.9 ug/l as indicated in Figure 28. Three samples collected from the system influent in December, 1989, and January and August, 1989, had MIBK concentrations in excess of the CRL with the maximum concentration found being approximately 24 ug/l. None of the samples collected from the carbon/alumina or air stripper effluents contained MIBK concentrations above the CRL indicating that the CPS effectively removed it.

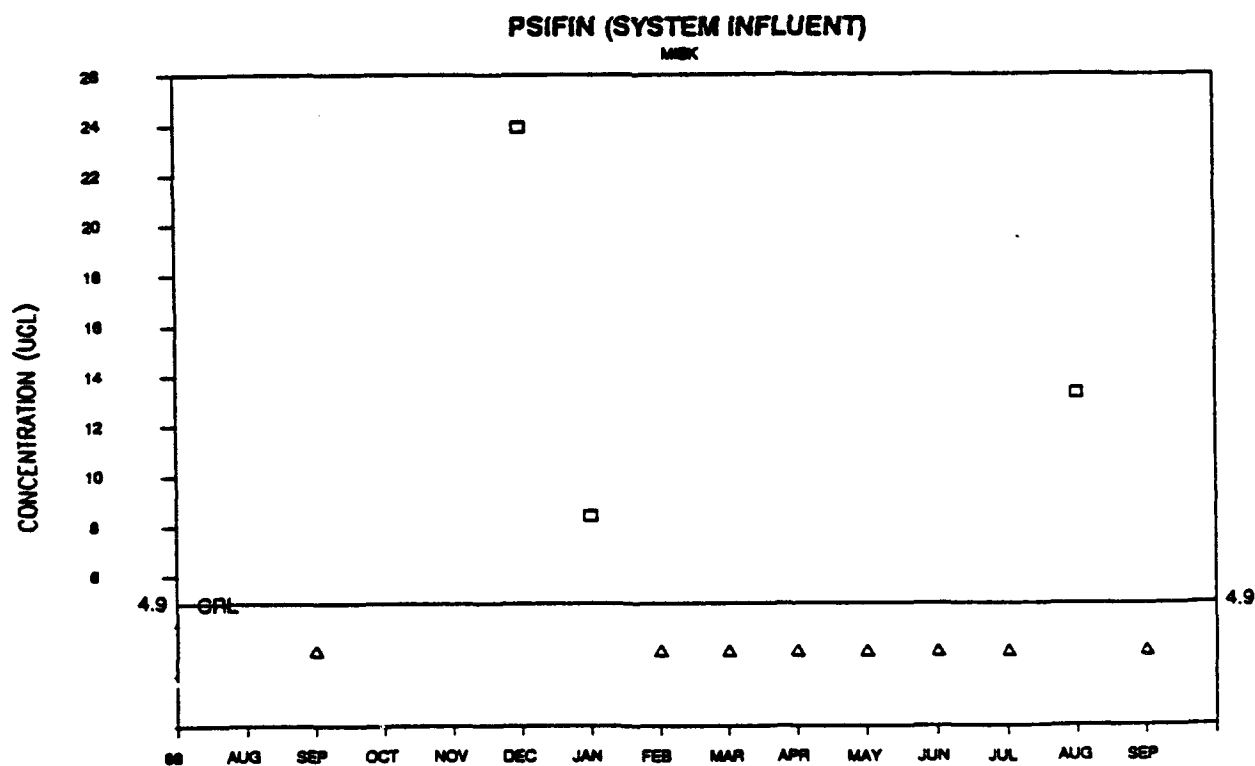


Figure 28. Methylisobutylketone Concentrations (Continued)

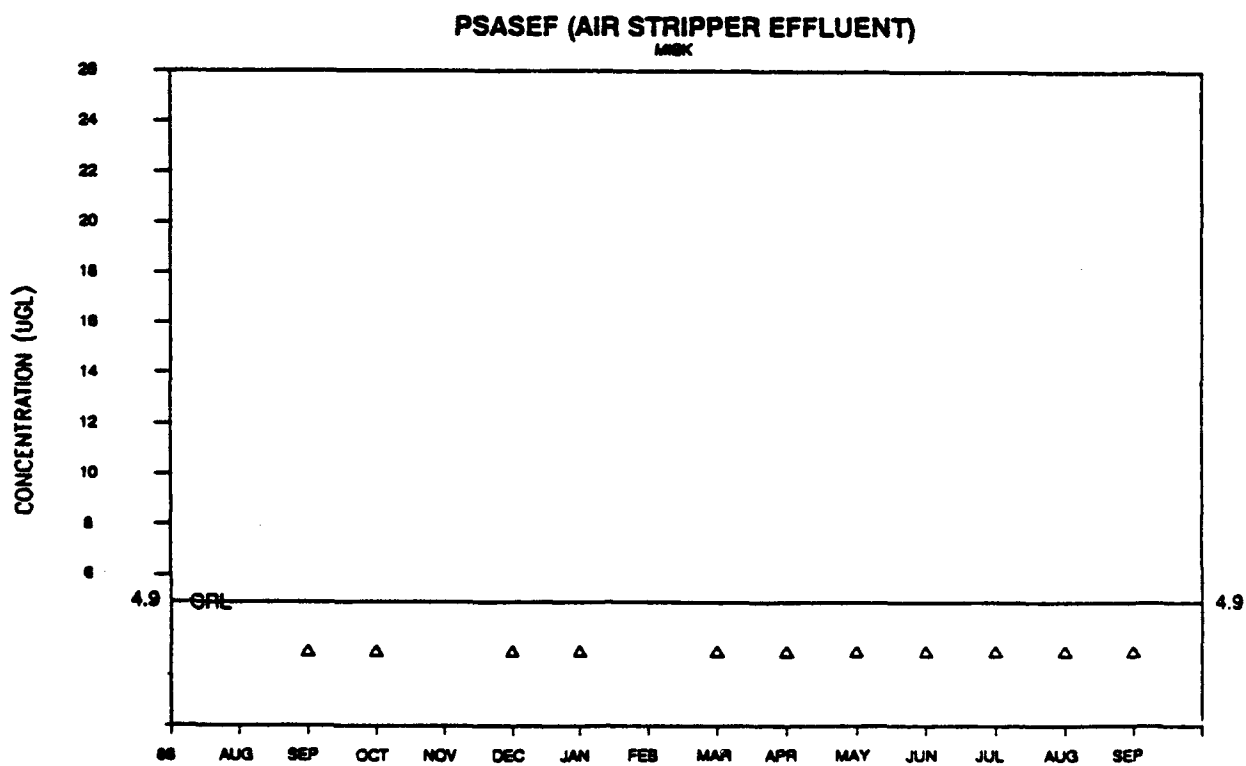
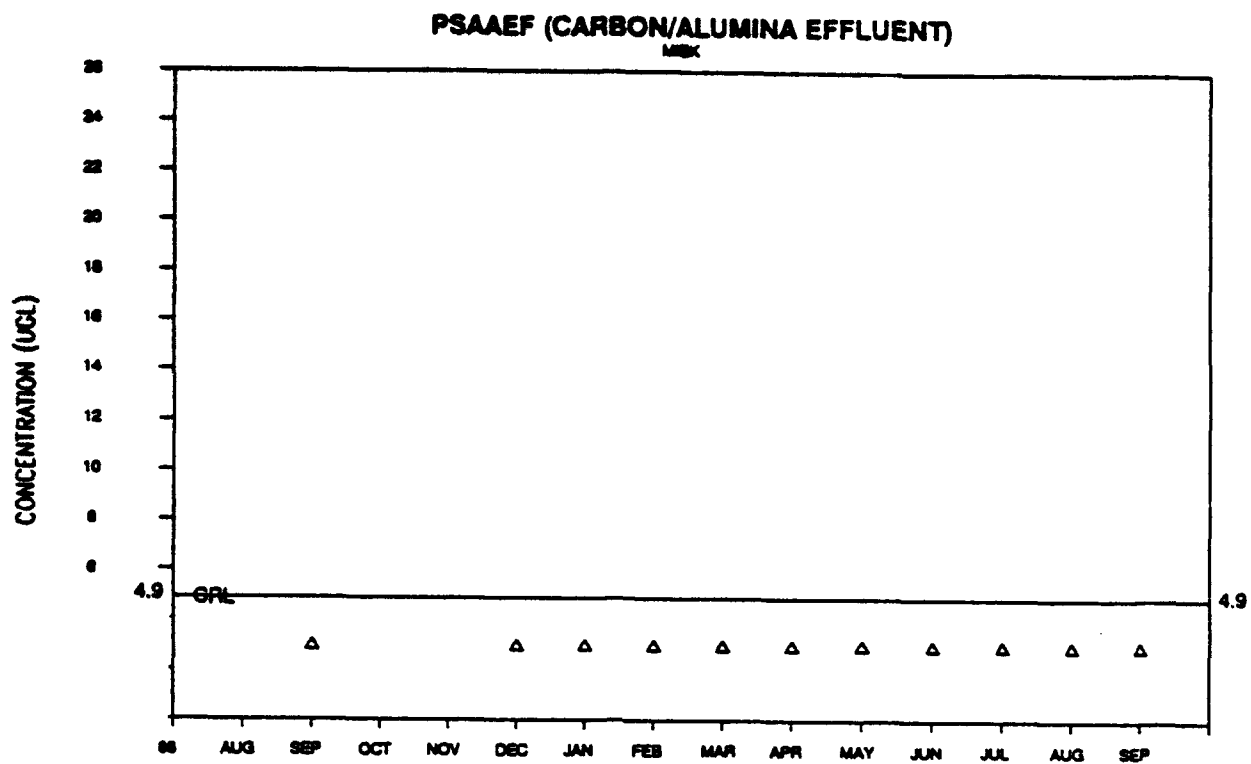


Figure 28. Methylisobutylketone (Concluded)

Malathion

47. The CRL for malathion (MLTHN) was 0.5 ug/l in August, 1988 but decreased to 0.373 ug/l for the rest of the study period as indicated in Figure 29. A majority of the samples collected from the system influent were found to contain malathion in excess of the CRL. The maximum concentration found was approximately 3.4 ug/l. Two samples collected from the carbon/alumina effluent in September, 1988, and July, 1989, had concentrations in excess of the CRL with a maximum concentration of approximately 1 ug/l. Only one sample collected from the air stripper effluent in September, 1988, had a concentration of malathion in excess of the CRL at approximately 0.5 ug/l. These results indicate that malathion was frequently found in the CPS influent during the study period and that the treatment system was generally successful in removing it.

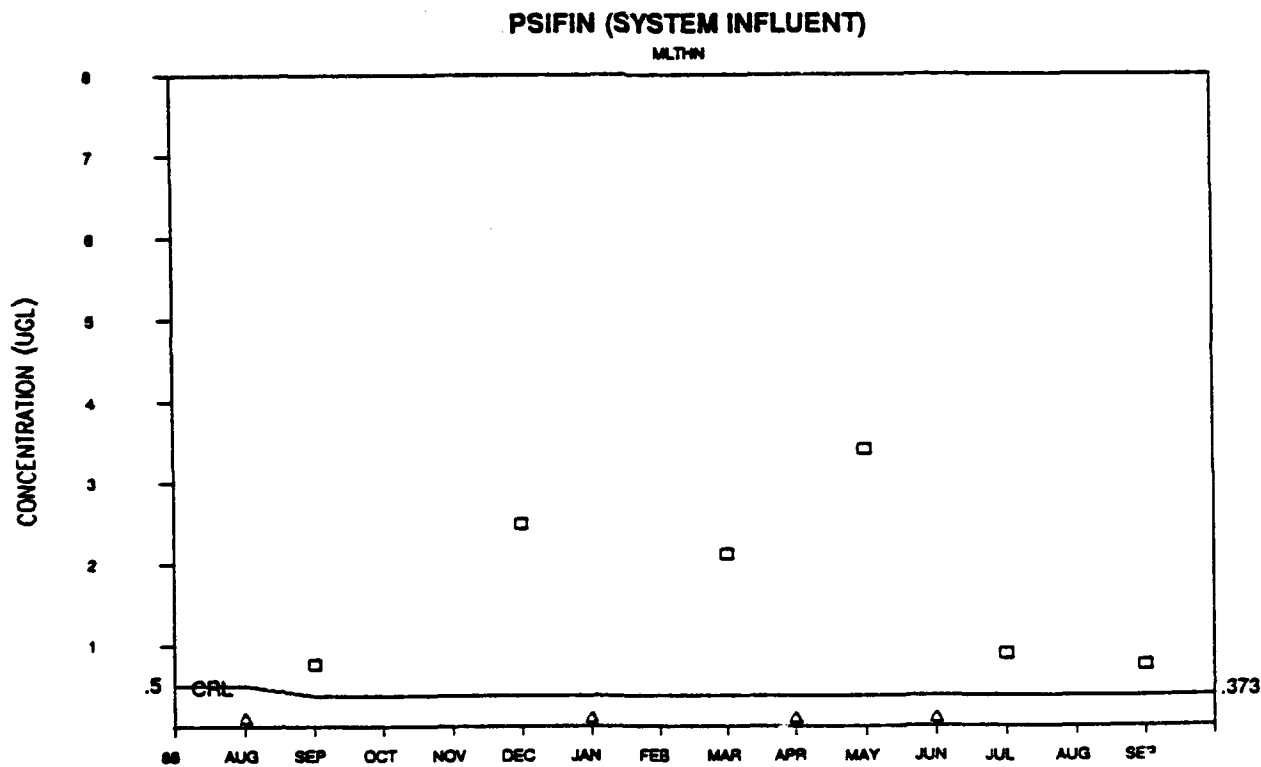


Figure 29. Malathion Concentrations (Continued)

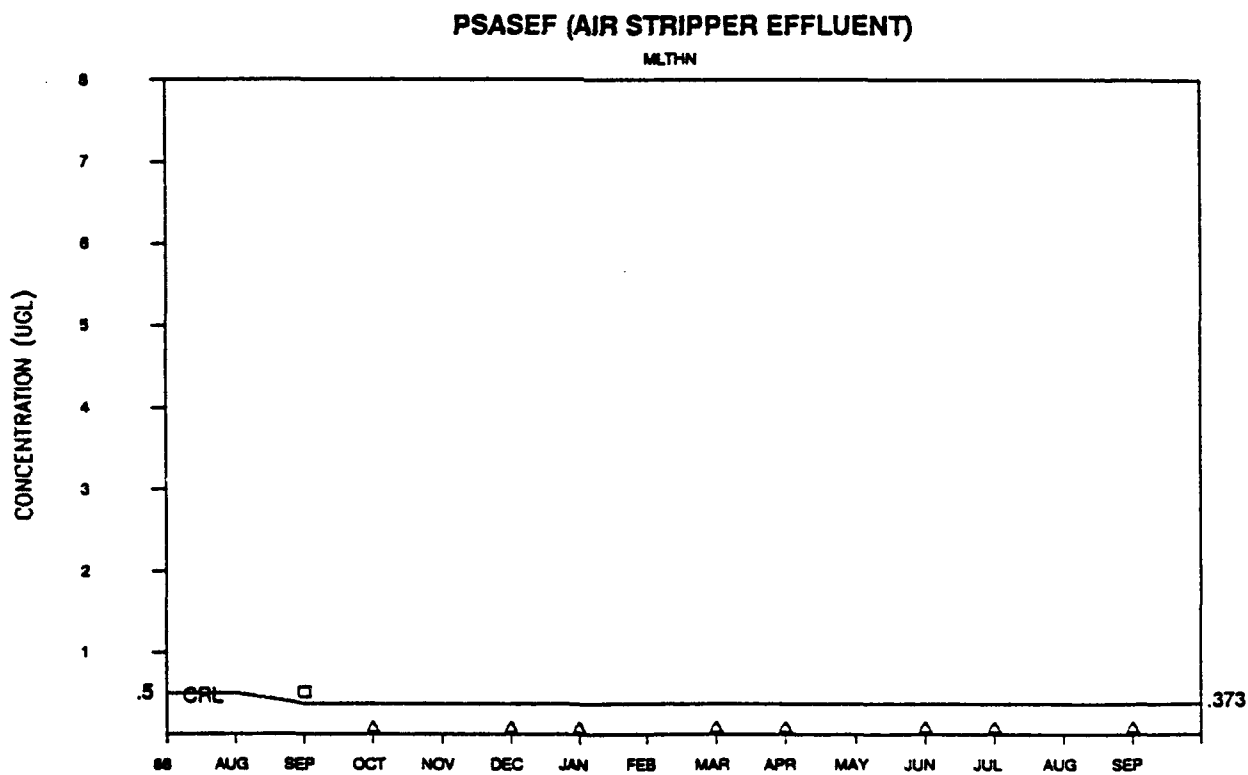
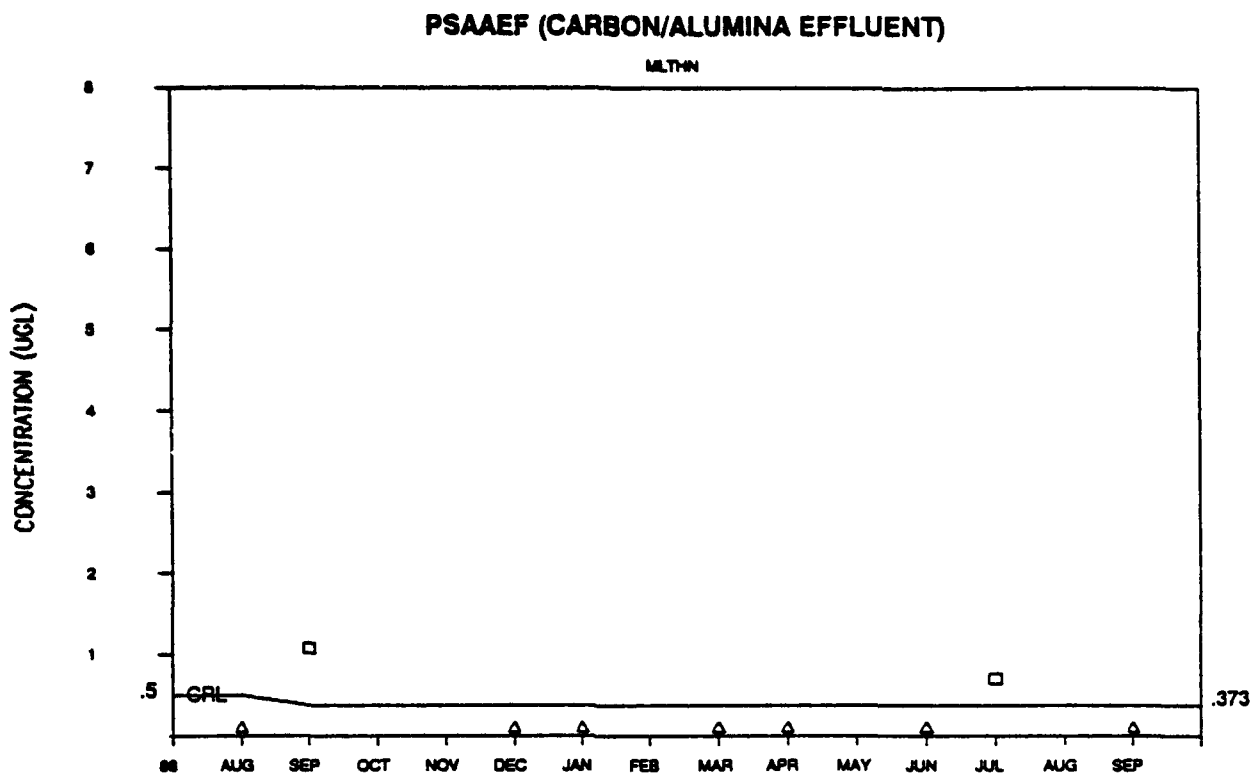


Figure 29. Malathion (Concluded)

p,p' - DDE

48. The CRL for p,p'-DDE (DDE) was 0.054 ug/l as indicated in Figure 30. A majority of the samples collected from the system influent were found to contain DDE in excess of the CRL with a maximum concentration of approximately 0.8 ug/l found in the sample collected in December 1988. None of the samples collected from the carbon/alumina effluent had DDE concentrations in excess of the CRL. Two samples collected from the air stripper effluent in June and August, 1989, had DDE concentrations in excess of the CRL with a maximum concentration of approximately 0.25 ug/l. In summary, DDE was a common contaminant in the influent to the CPS and the treatment system was only partially successful in removing it.

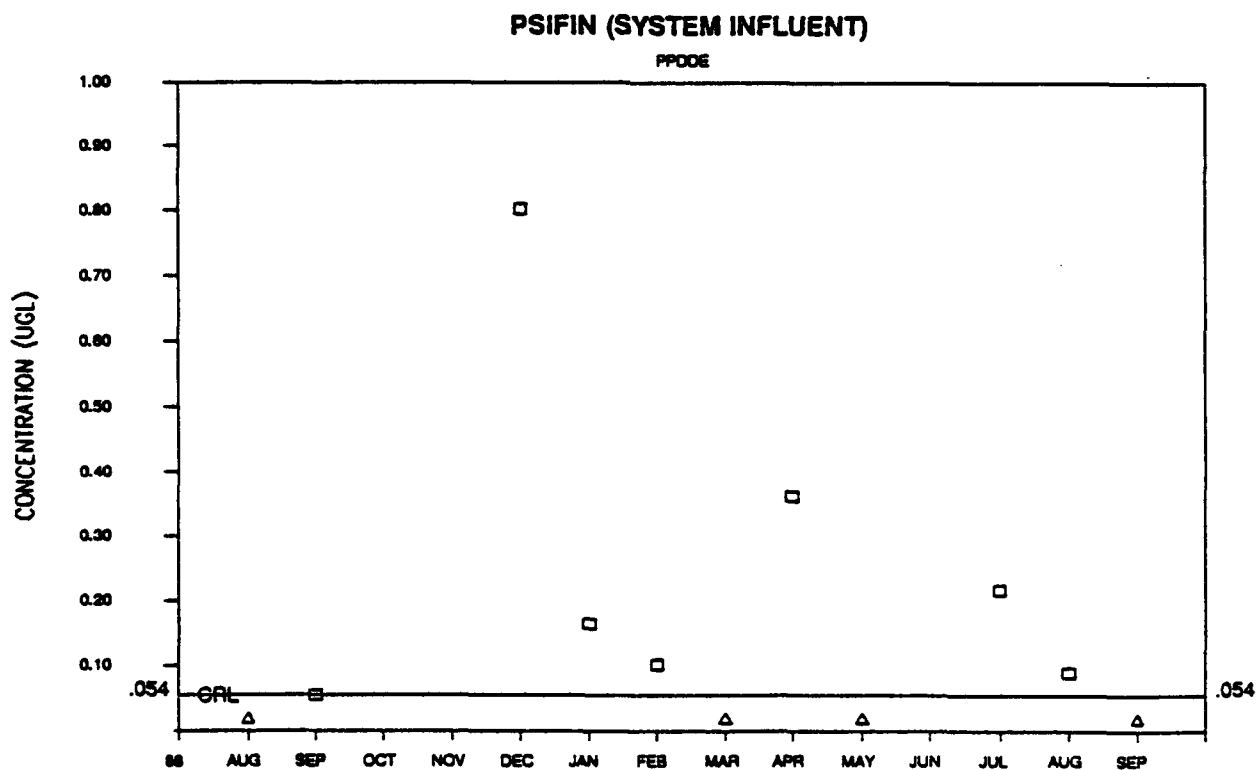


Figure 30. p,p'-DDE concentrations (Continued)

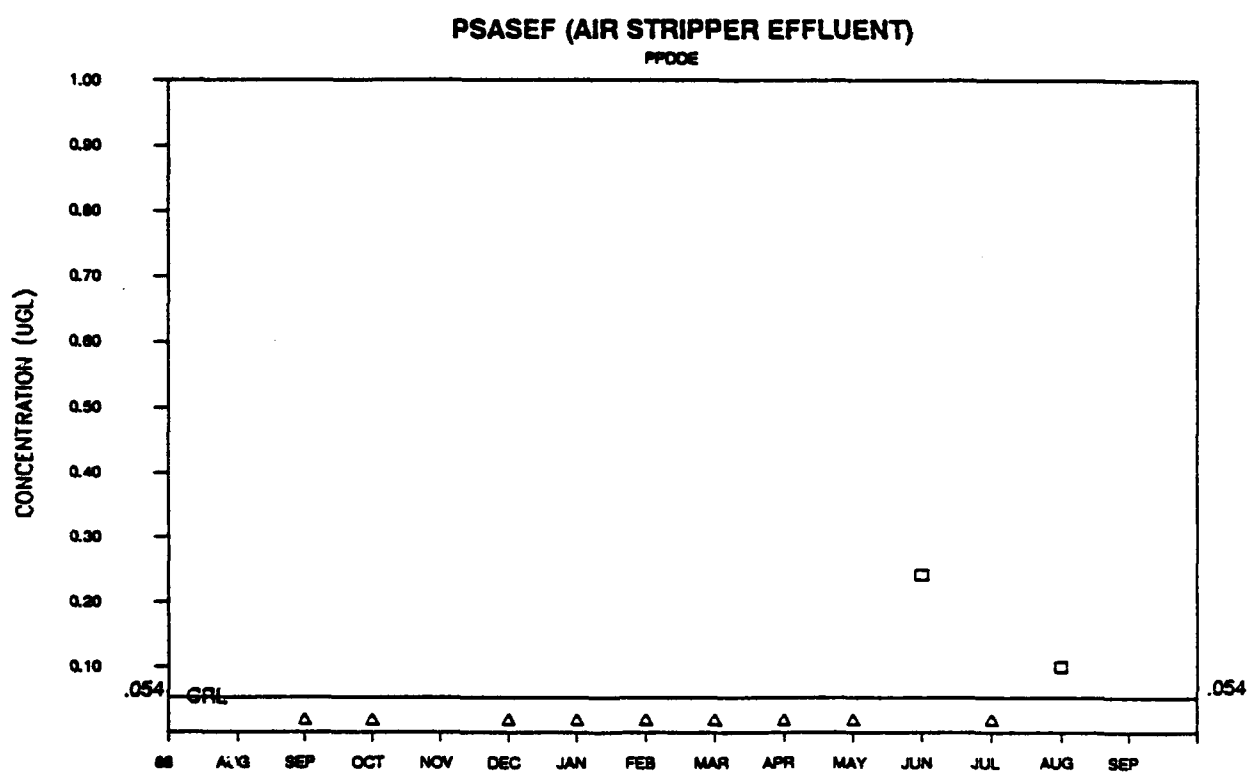
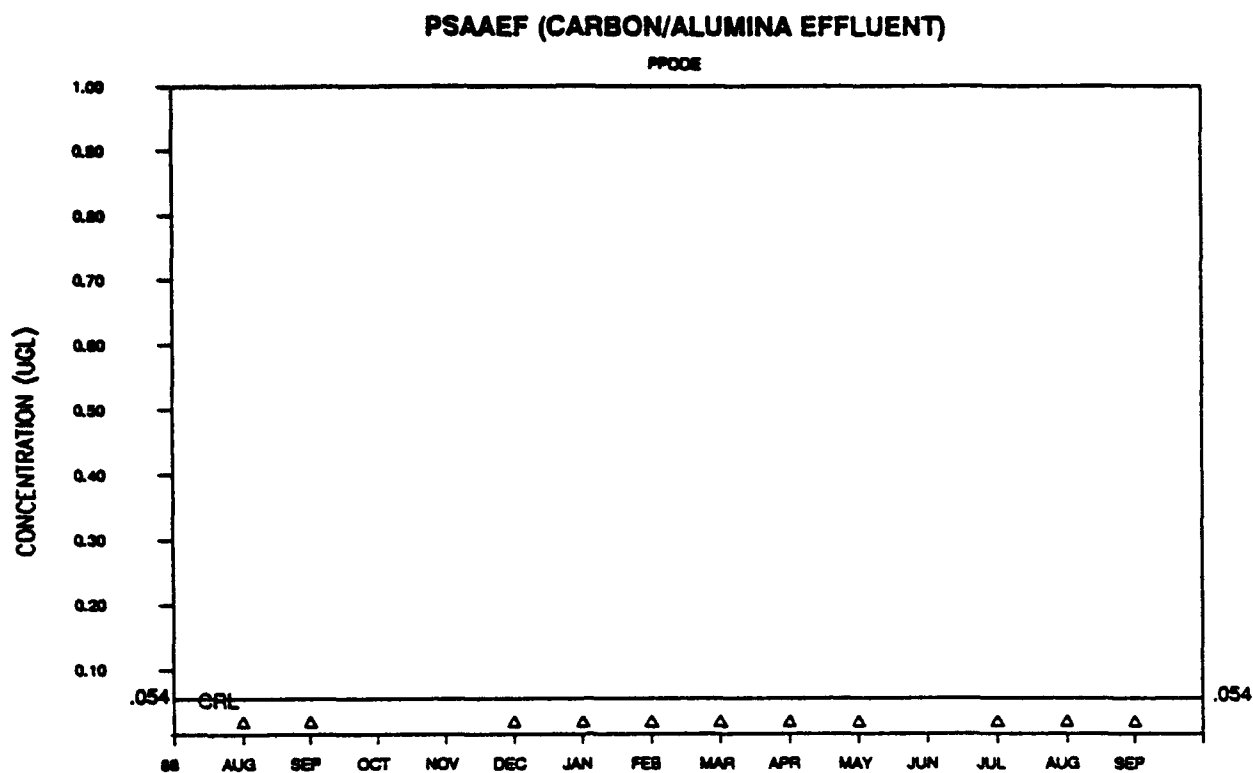


Figure 30. p,p'-DDE (Concluded)

p,p' - DDT

49. The CRL for p,p'-DDT (DDT) was 0.049 ug/l as indicated in Figure 31. One half of the samples collected from the system influent over the study period were found to contain DDT in excess of the CRL with a maximum concentration of approximately 0.45 ug/l. Two samples collected from the carbon/alumina effluent in August and September, 1988, had DDT concentrations in excess of the CRL with a maximum concentration of approximately 0.1 ug/l. Two samples collected from the air stripper effluent in June and August, 1989, had DDT concentrations in excess of the CRL with a maximum concentration of approximately 0.15 ug/l. These results indicate that DDT was a common contaminant in the influent to the CPS and that the treatment system was only partially successful in removing it.

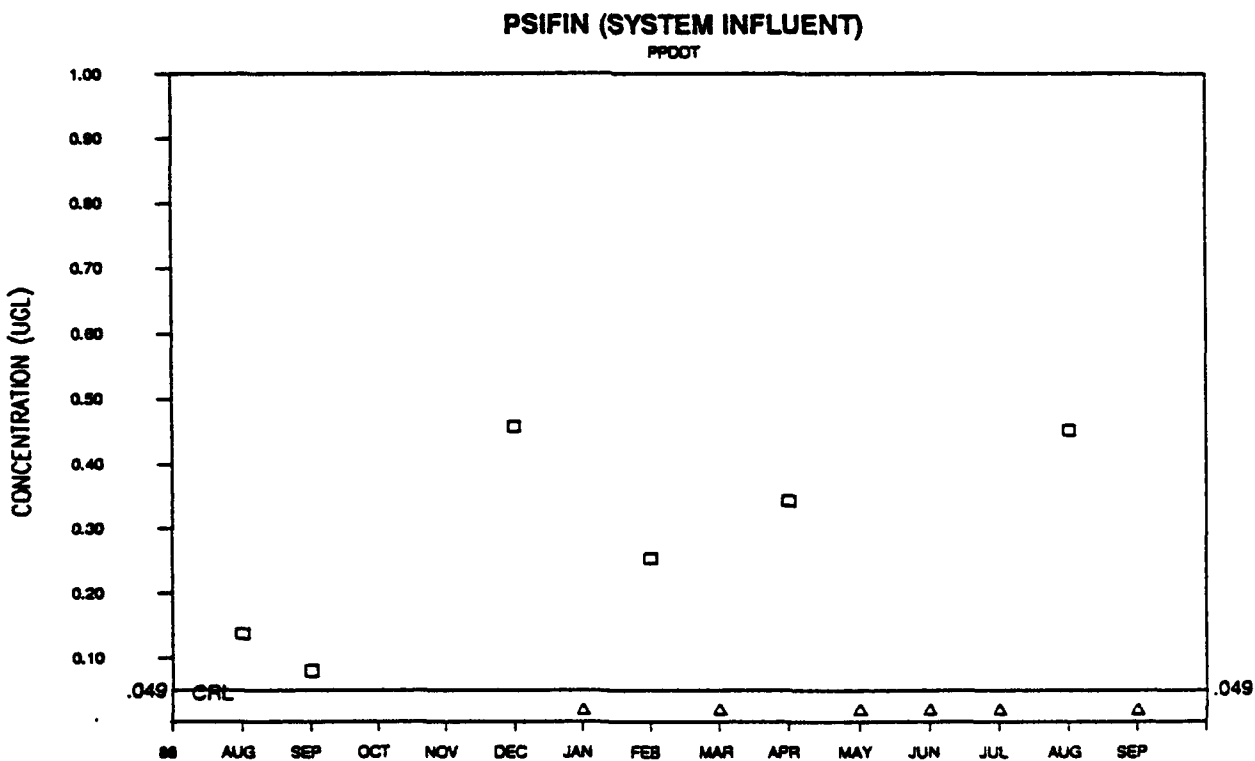


Figure 31. p,p'-DDT concentrations (Continued)

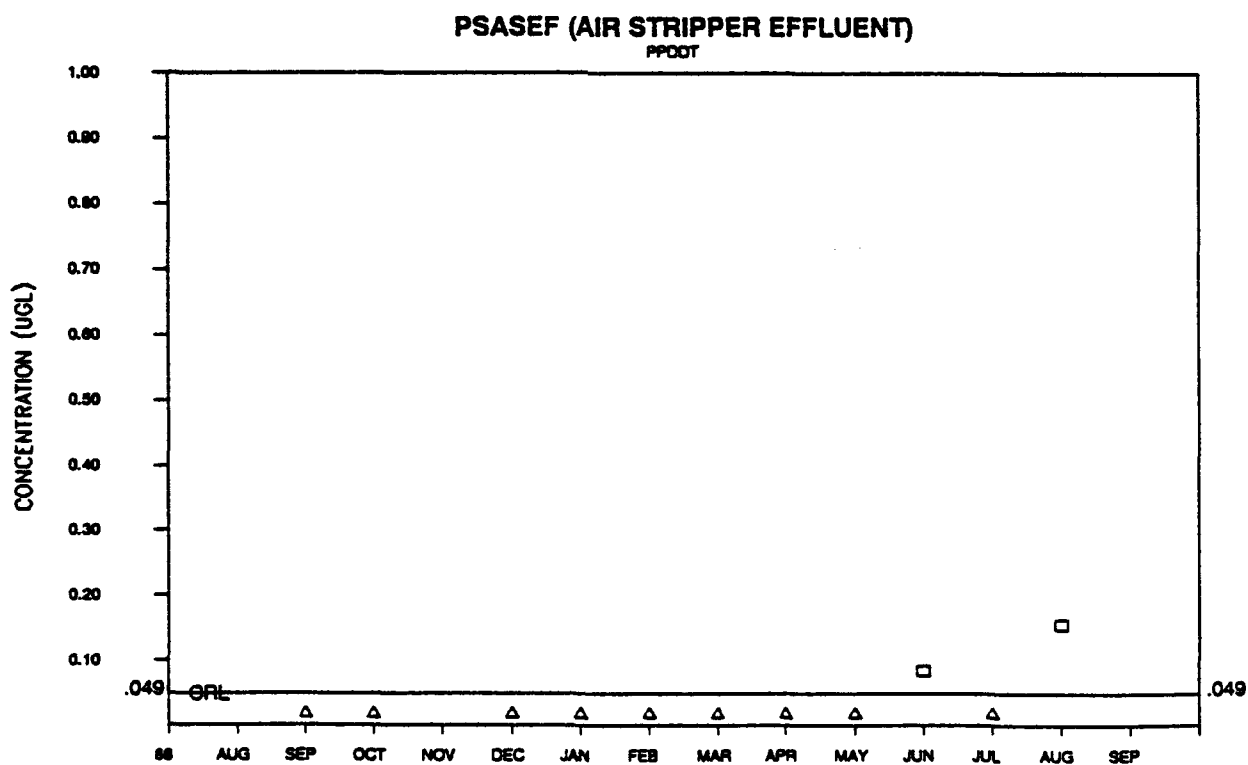
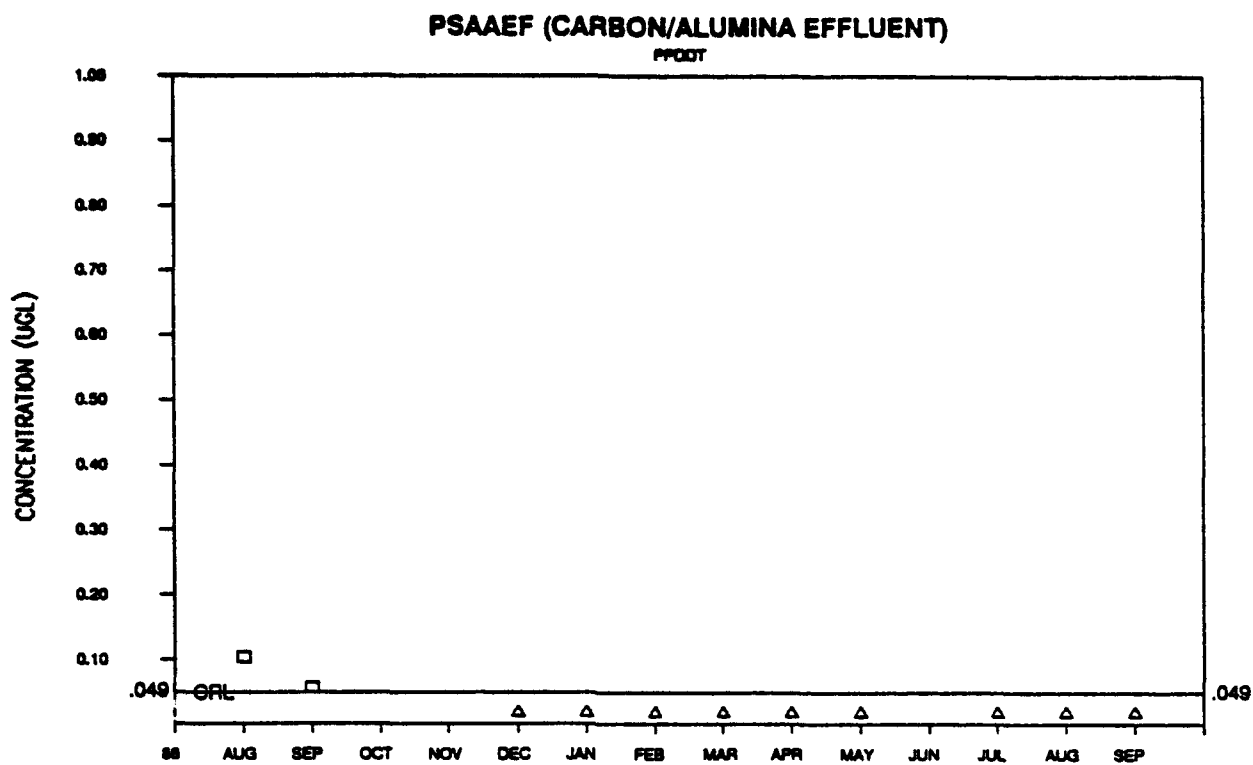


Figure 31. p,p'-DDT (Concluded)

Parathion

50. The CRL for parathion (PRTHN) was 0.647 ug/l as indicated in Figure 32. Three samples collected from the system influent in September and December, 1988, and March, and June 1989, contained parathion in excess of the CRL with a maximum concentration of approximately 20 ug/l. One sample collected from the carbon/alumina effluent in August, 1989, contained parathion in excess of the CRL at 7.9 ug/l. One sample collected from the air stripper effluent in September, 1988, had a parathion concentration just slightly above the CRL. These results indicate that parathion was only infrequently found in the influent to the CPS and that the treatment system was generally effective in removing it.

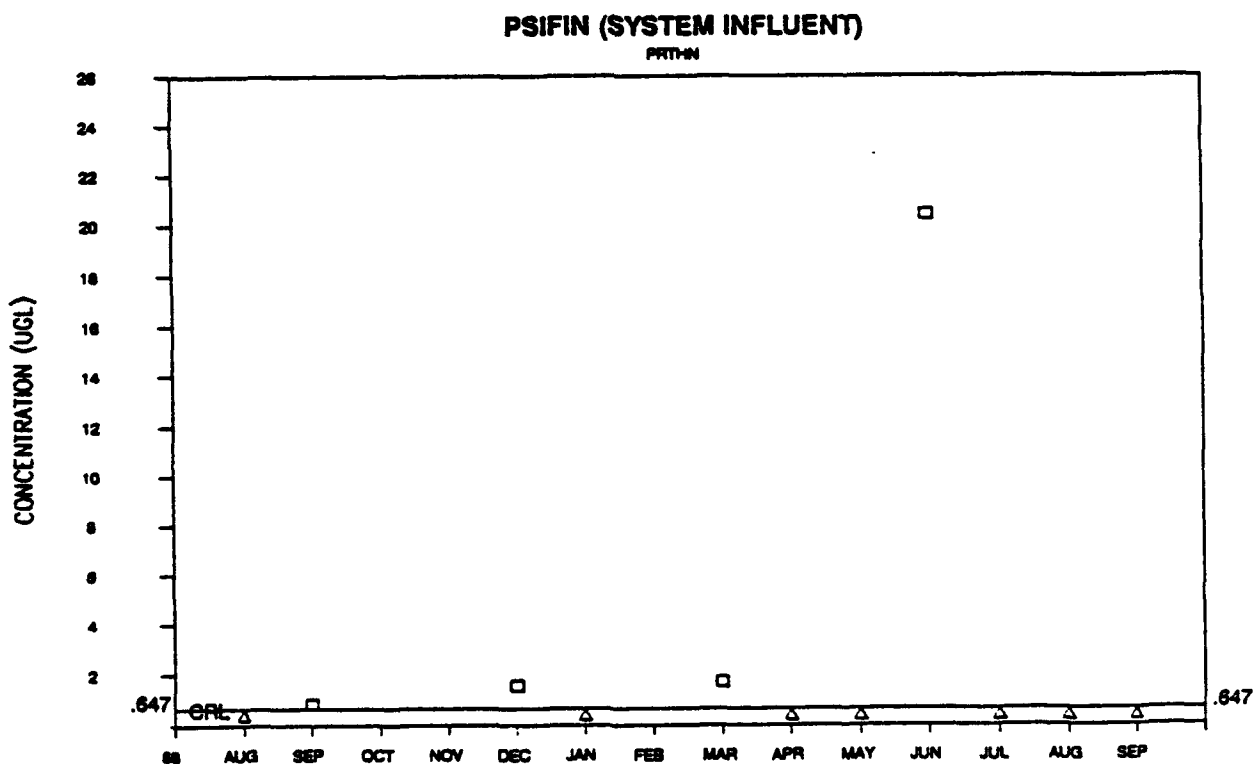
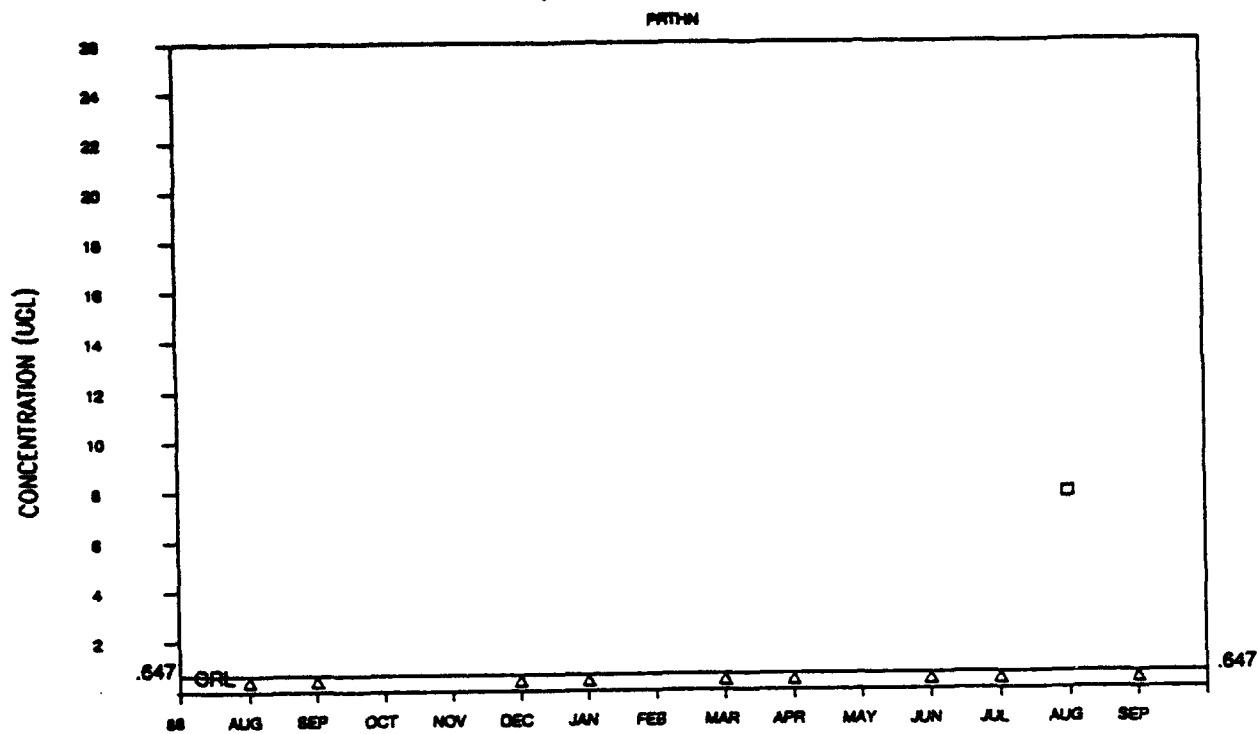


Figure 32. Parathion Concentrations (Continued)

PSAAEF (CARBON/ALUMINA EFFLUENT)



PSASEF (AIR STRIPPER EFFLUENT)

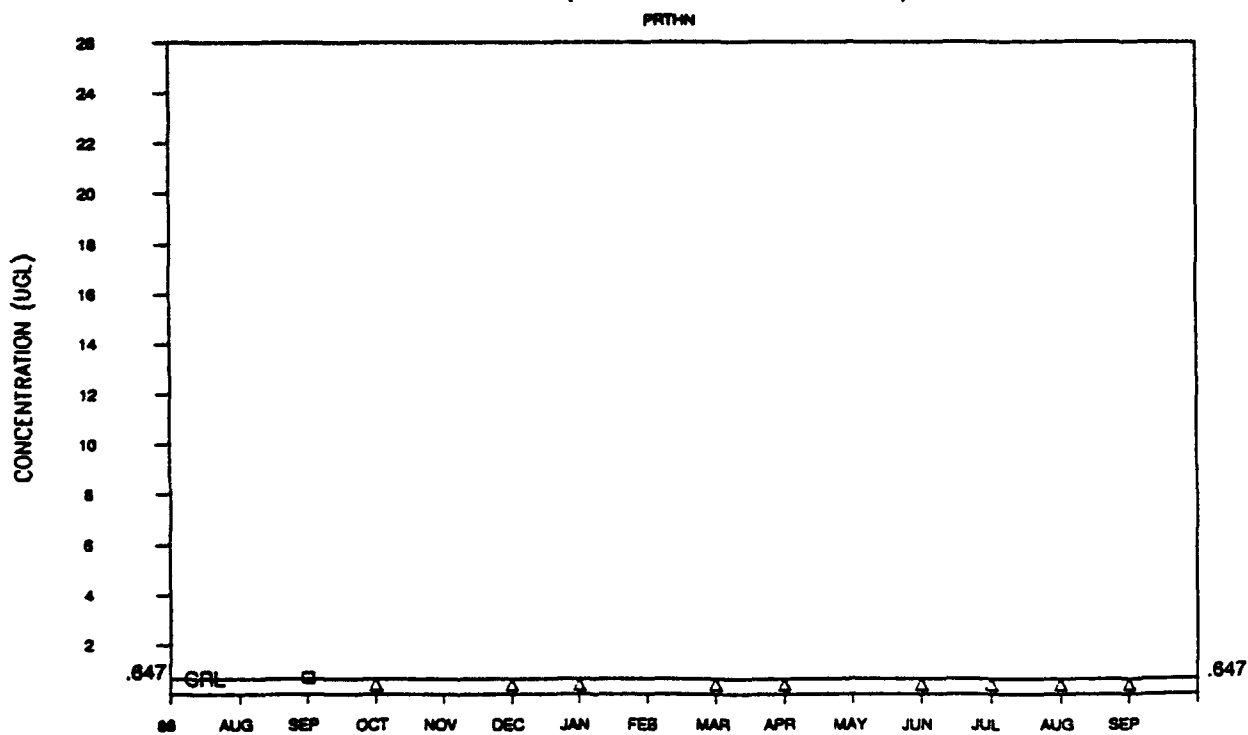


Figure 32. Parathion (Concluded)

Sulfate

51. No CRL was reported for sulfate (SO_4). Sulfate data were reported only after January, 1989. The average sulfate concentrations in the system influent, carbon/alumina effluent, and air stripper effluent were 156 mg/l, 145 mg/l, and 160 mg/l, respectively as shown in Figure 33. The maximum concentrations reported in the system influent and air stripper effluent were approximately 200 mg/l and 190 mg/l, respectively. These data indicate that sulfate was not removed by the treatment system.

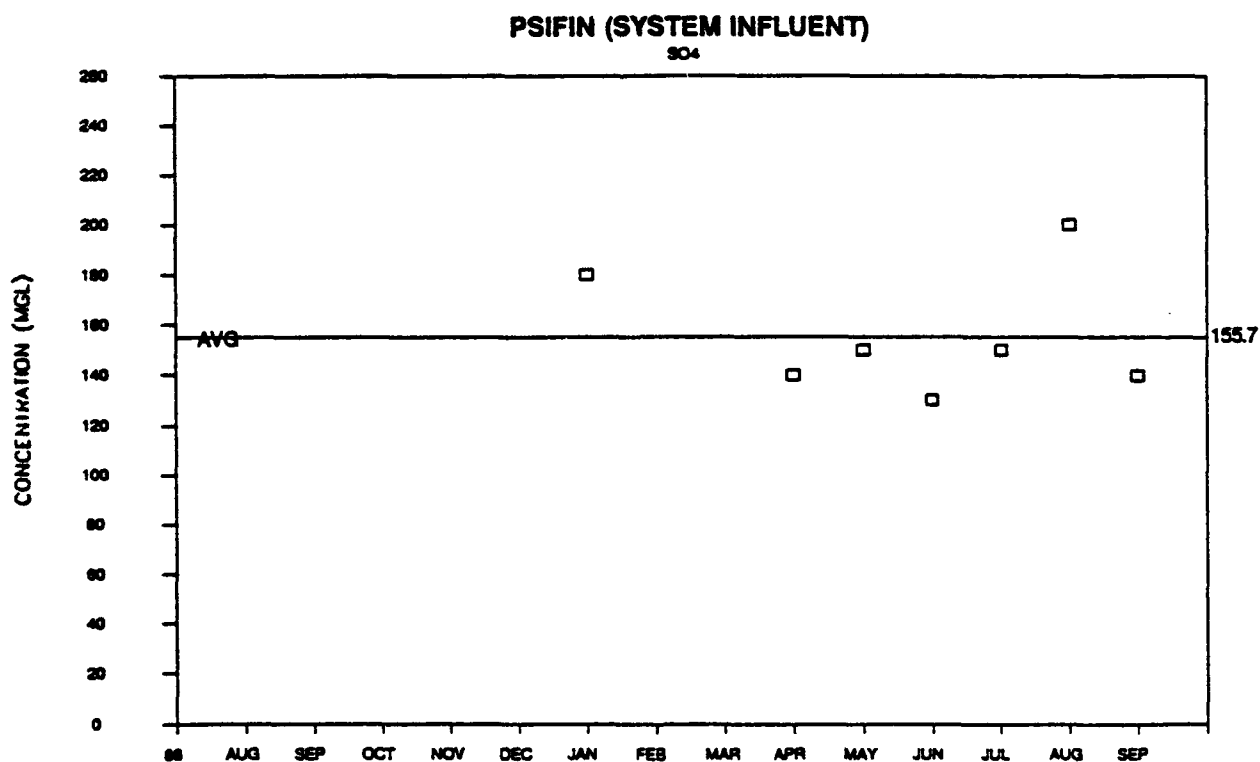
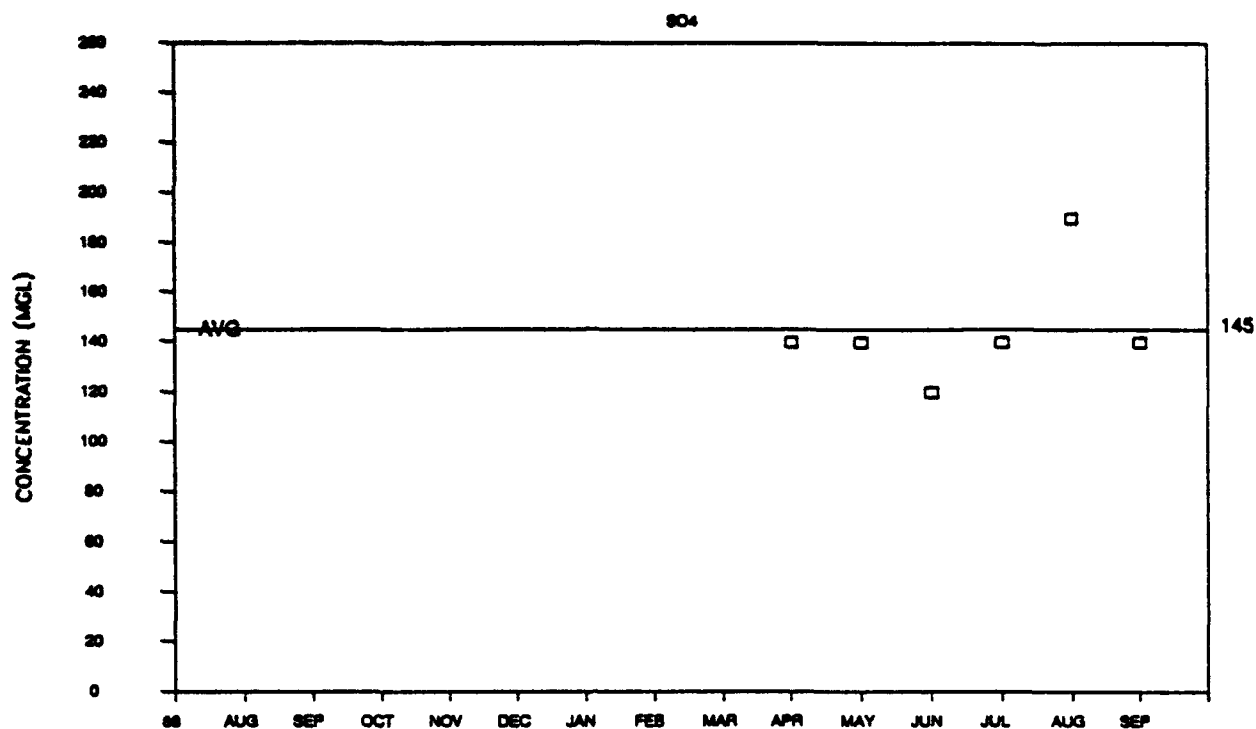


Figure 33. Sulfate concentrations (Continued)

PSAAEF (CARBON/ALUMINA EFFLUENT)



PSASEF (AIR STRIPPER EFFLUENT)

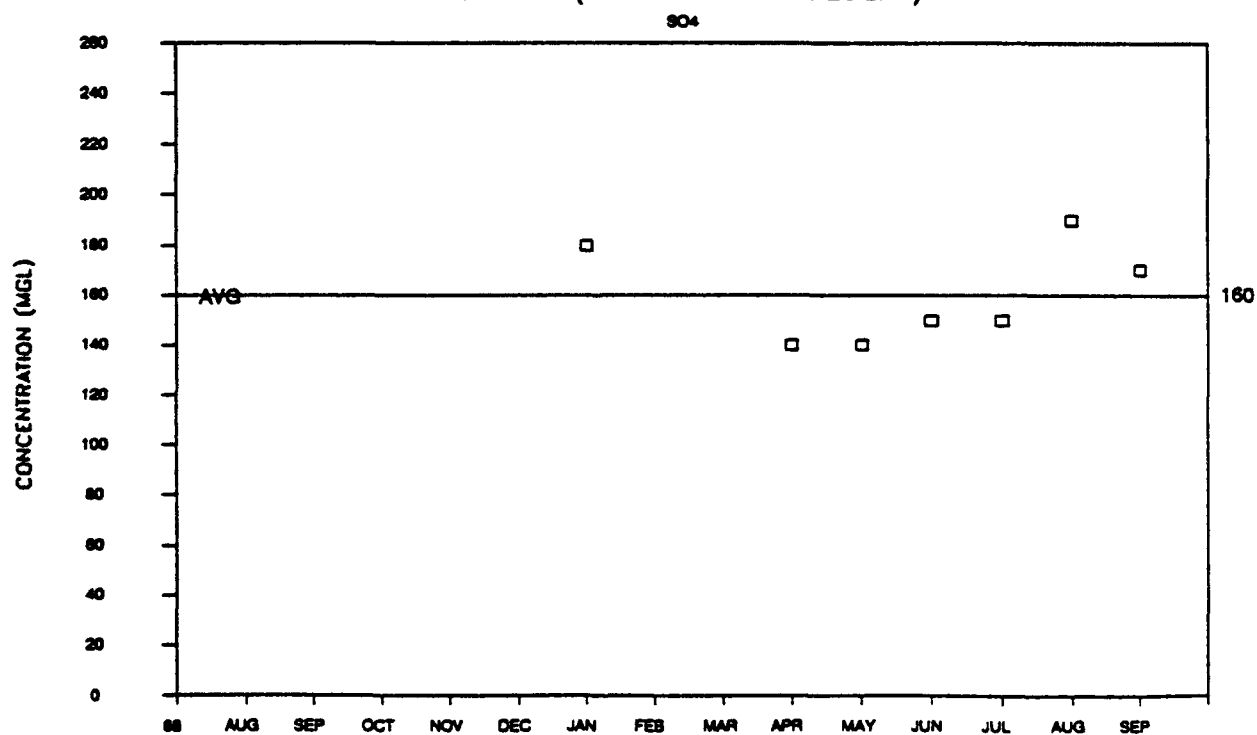


Figure 33. Sulfate (Concluded)

Suona

52. The CRL for suona was 0.787 ug/l as indicated in Figure 34. No concentrations of suona above the CRL were found in any of the samples collected from the system influent or carbon/alumina effluent over the study period. Two samples collected from the air stripper effluent in September, 1988, and April, 1989, were found to contain suona in excess of the CRL with a maximum concentration of approximately 1.9 ug/l. Thus, suona was not a contaminant of much significance for the CPS during the study period.

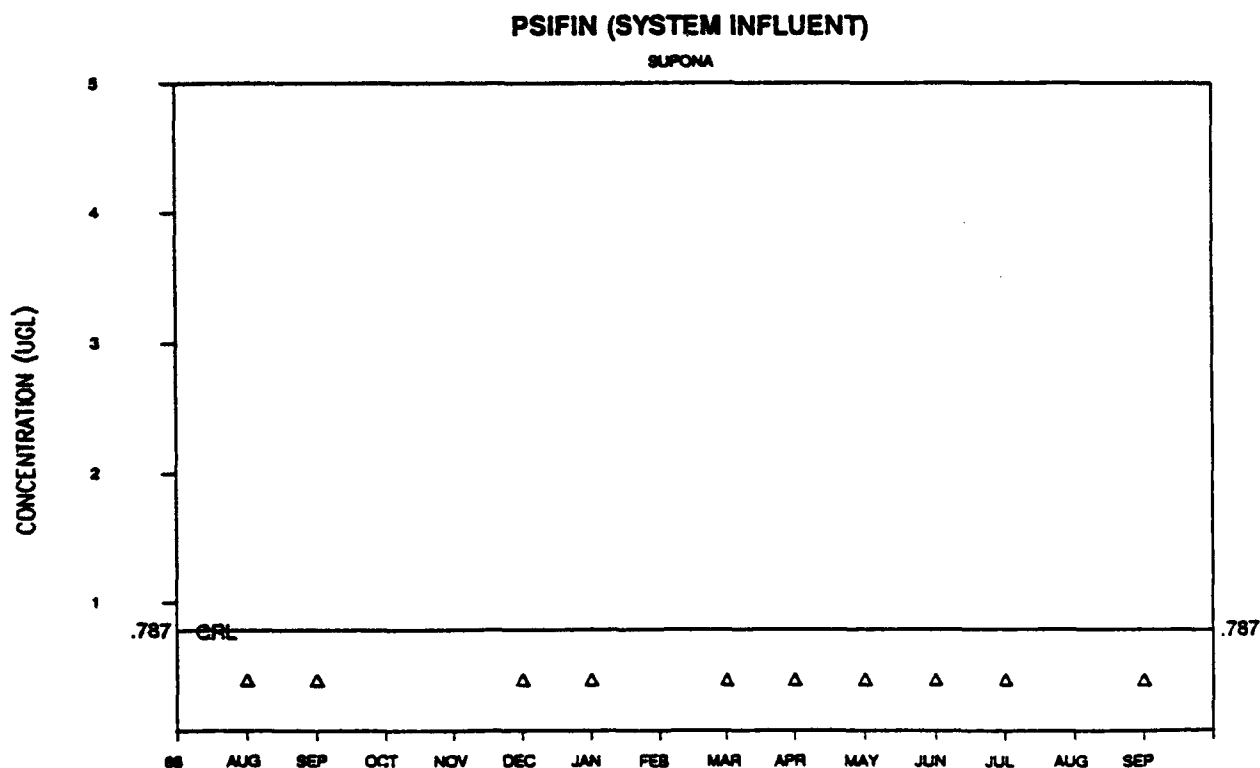


Figure 34. Suona Concentrations (Continued)

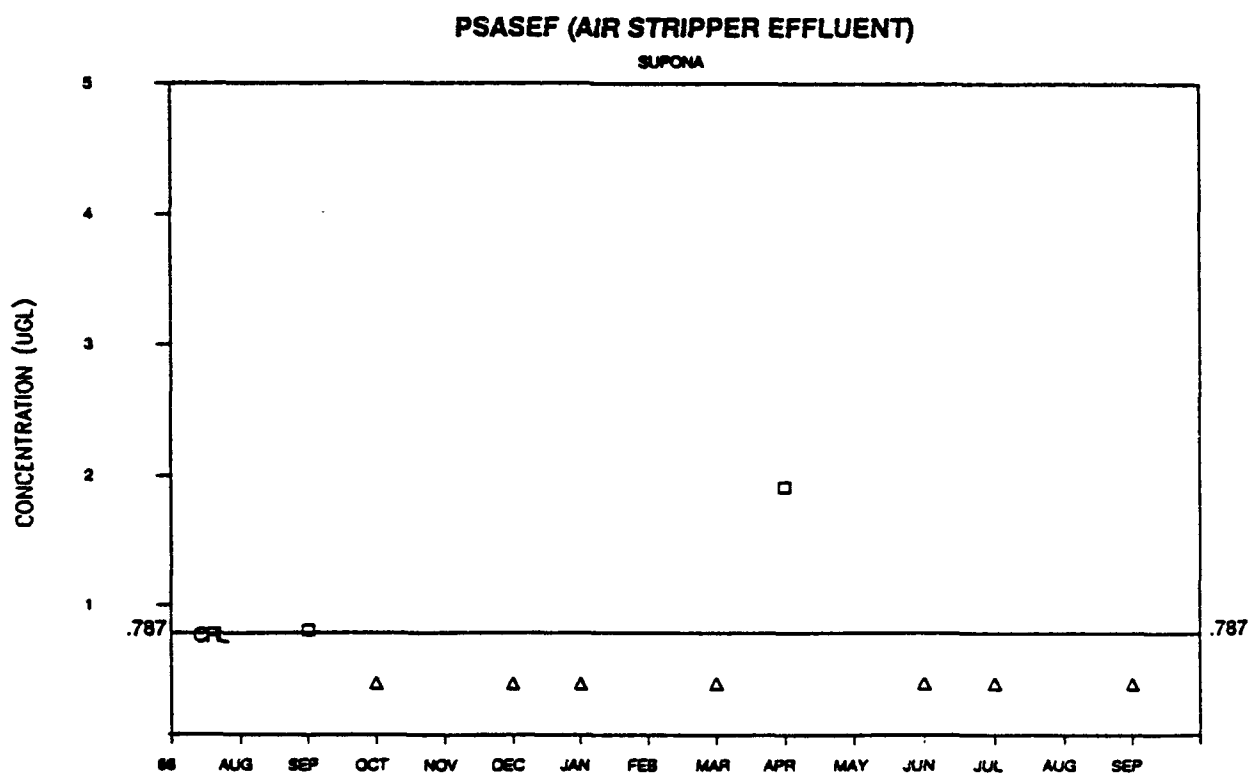
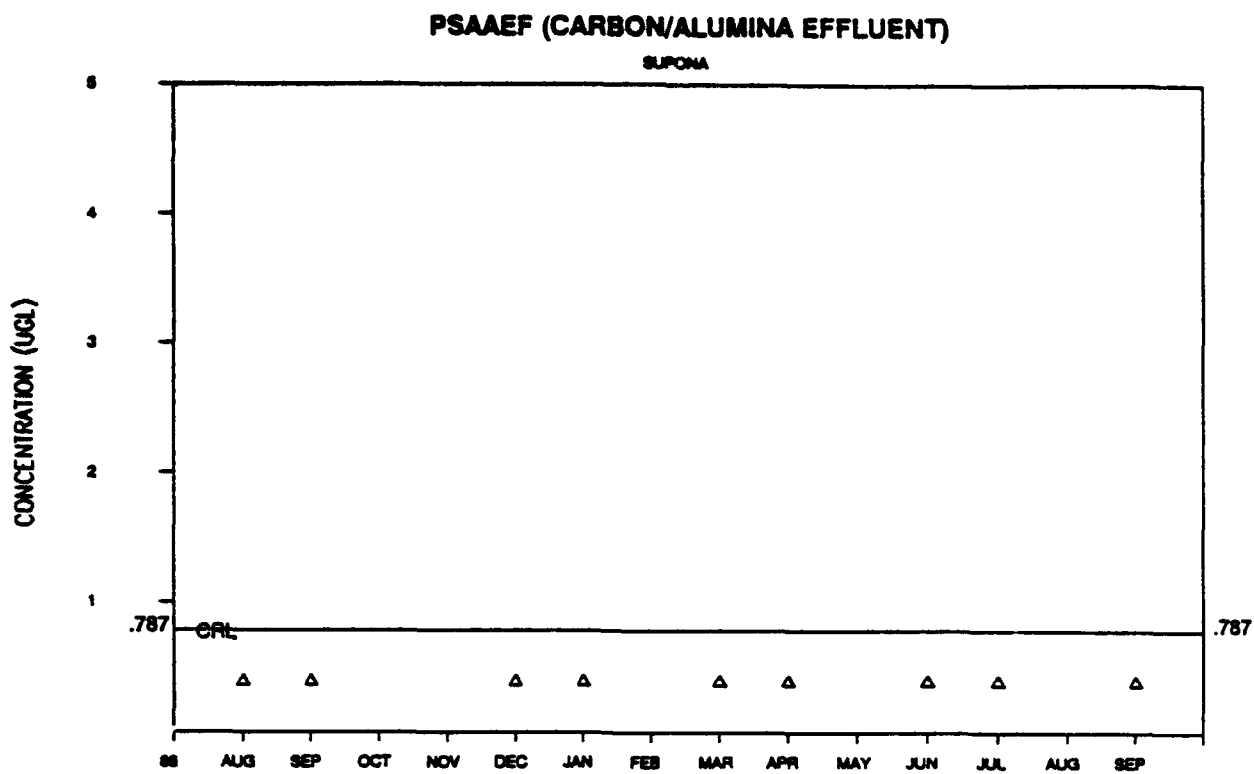


Figure 34. Supona (Concluded)

Tetrachloroethylene

53. As indicated in Figure 35, the CRL for tetrachloroethylene (TCLEE) was 0.75 ug/l. Most all of the samples collected from the system influent during the study period had concentrations of tetrachloroethylene in excess of the CRL. The maximum concentration found was approximately 3.9 ug/l with an average over the study period of 2.42 ug/l. None of the samples collected from the carbon/alumina or air stripper effluents contained tetrachloroethylene concentrations above the CRL. These results indicate that tetrachloroethylene was a major contaminant in the CPS influent during the study period and that the treatment system effectively removed it.

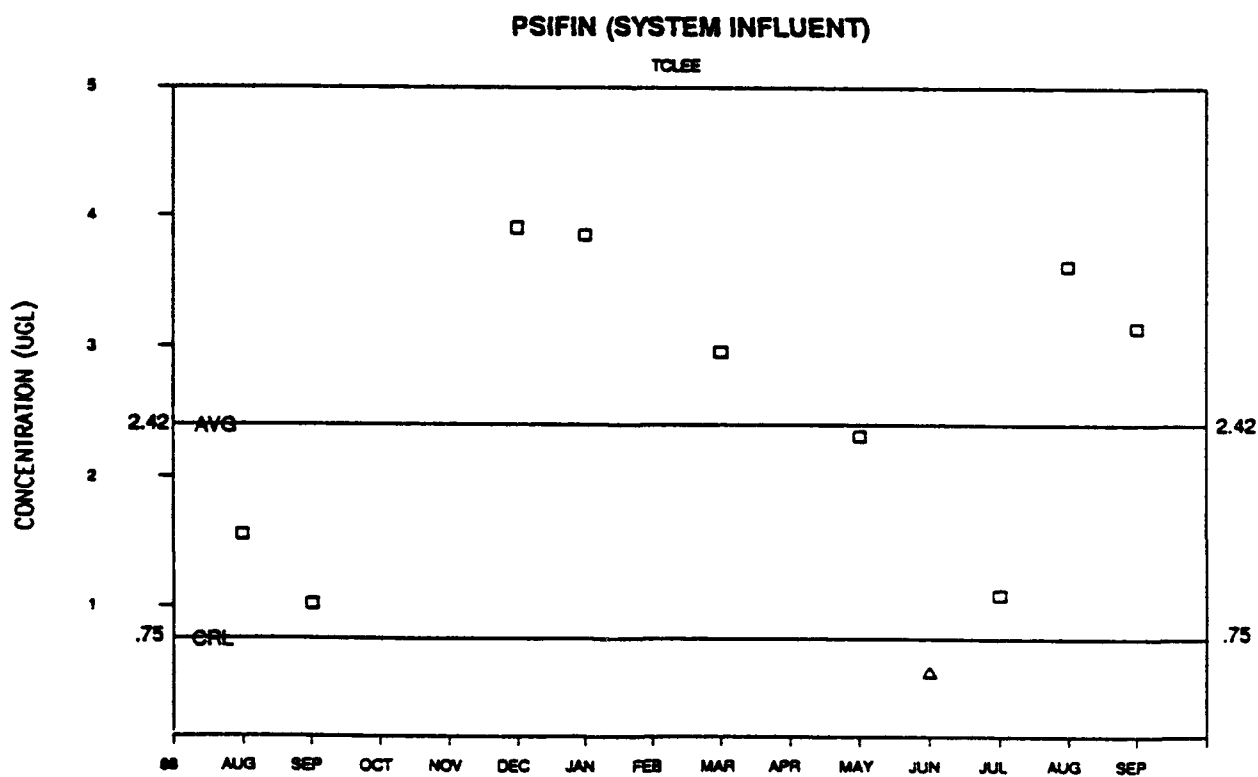


Figure 35. Tetrachloroethylene Concentrations (Continued)

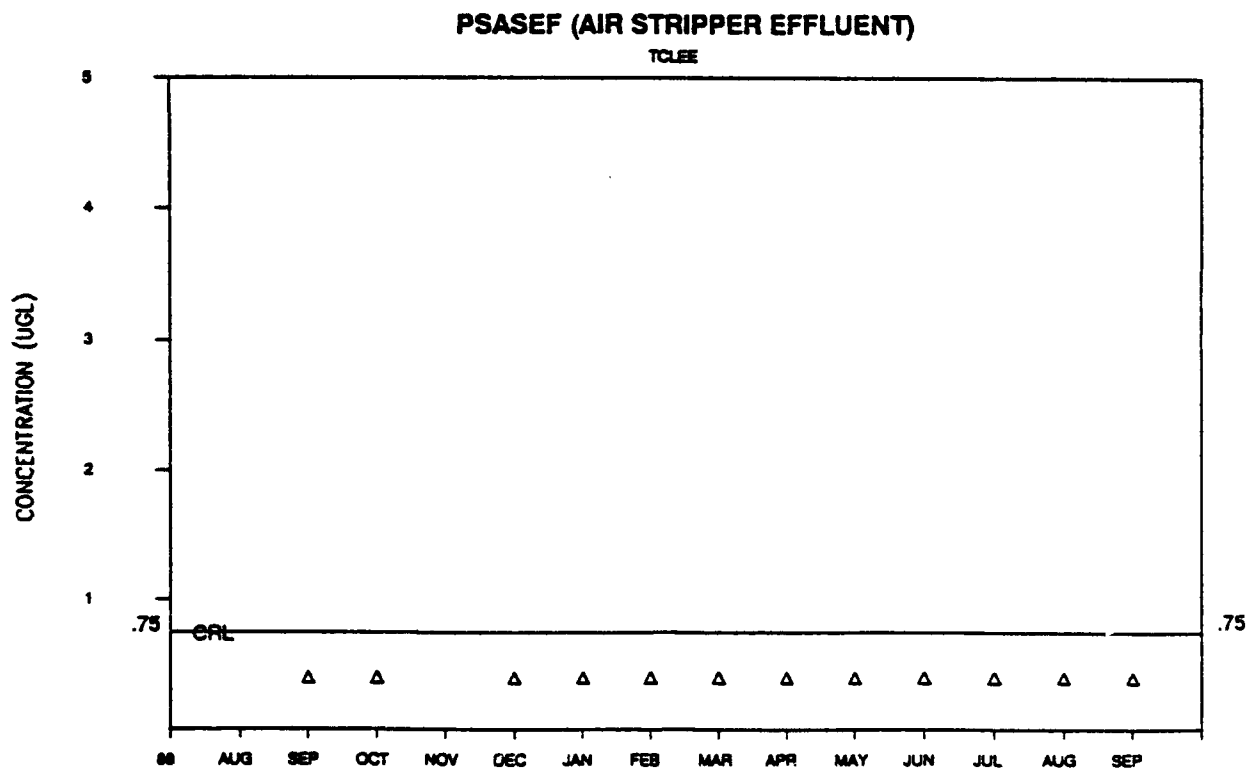
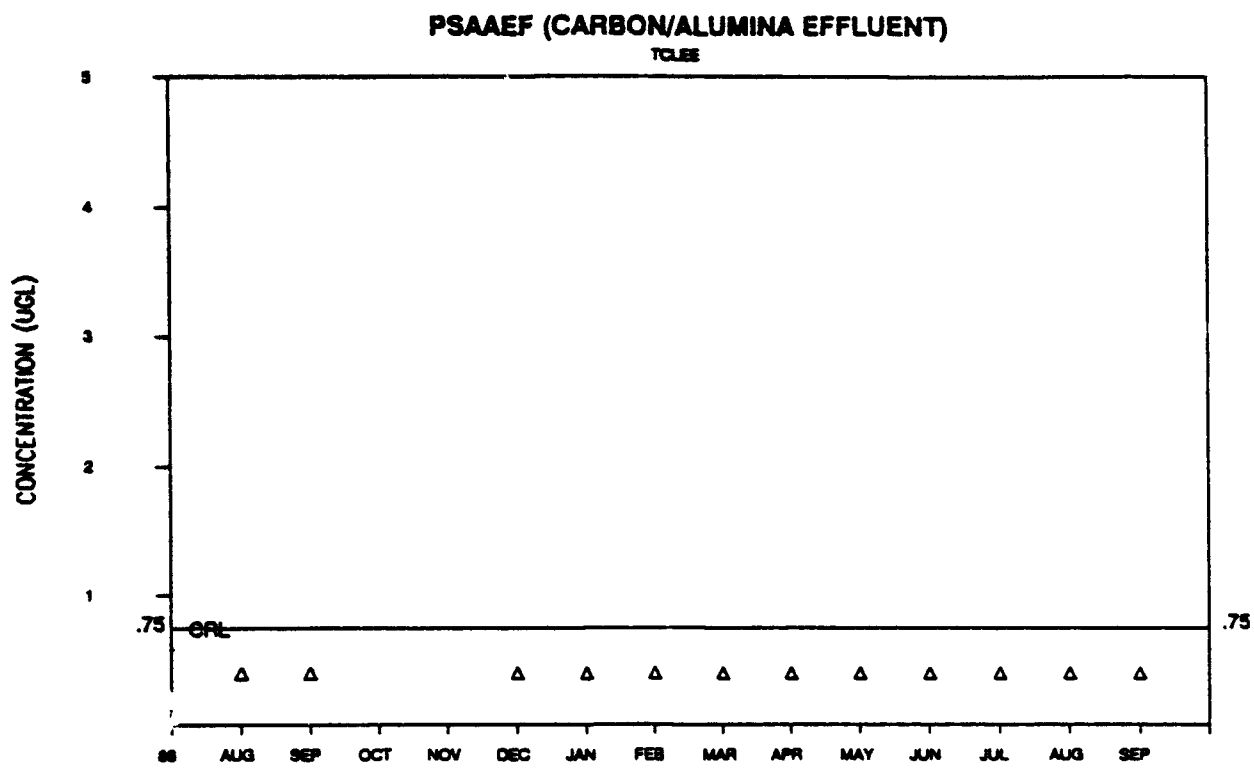


Figure 35. Tetrachloroethylene (Concluded)

Trichloroethylene

54. The CRL for trichloroethylene (TRCLE) was 0.56 ug/l as indicated in Figure 36. Two samples collected from the system influent in January, and March, 1989, were found to contain trichloroethylene in excess of the CRL. The maximum concentration found was approximately 1.8 ug/l. None of the samples collected from the carbon/alumina or air stripper effluents contained trichloroethylene in concentrations above the CRL. These results indicate that trichloroethylene was only occasionally found in the CPS influent during the study period and that the treatment system effectively removed it.

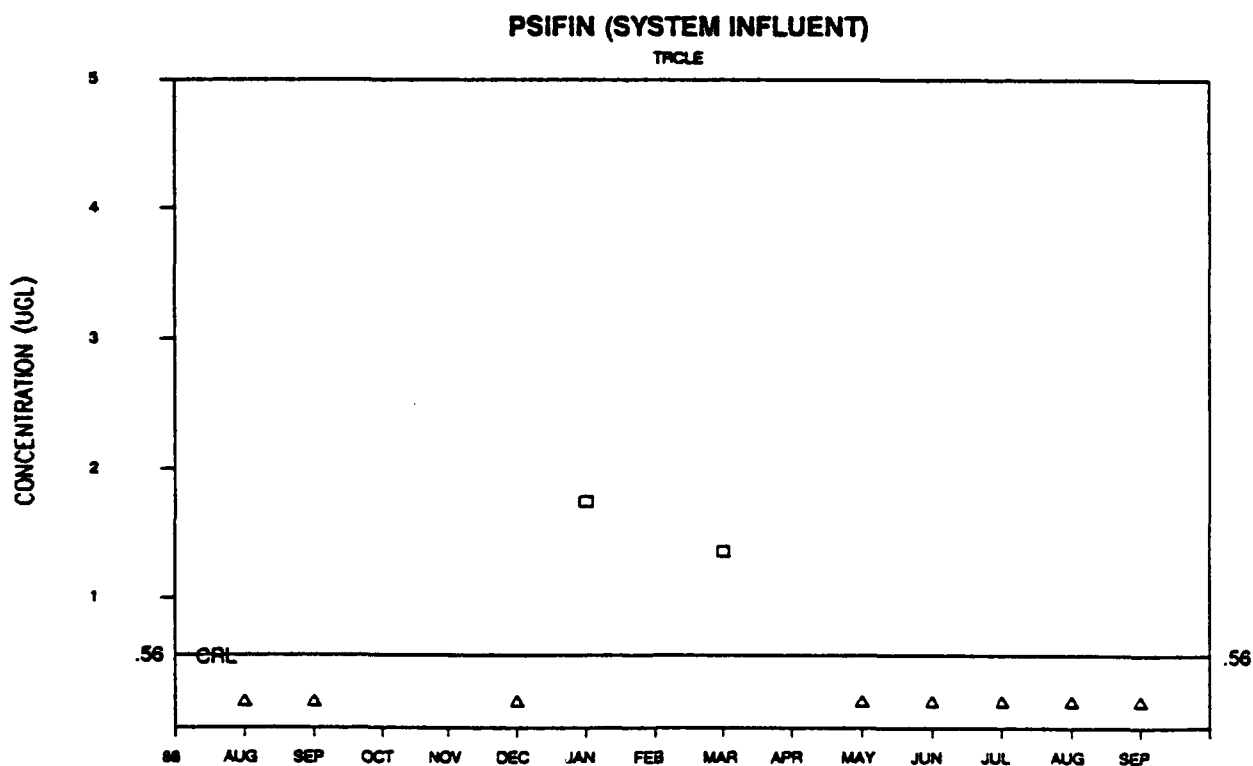


Figure 36. Trichloroethylene Concentrations (Continued)

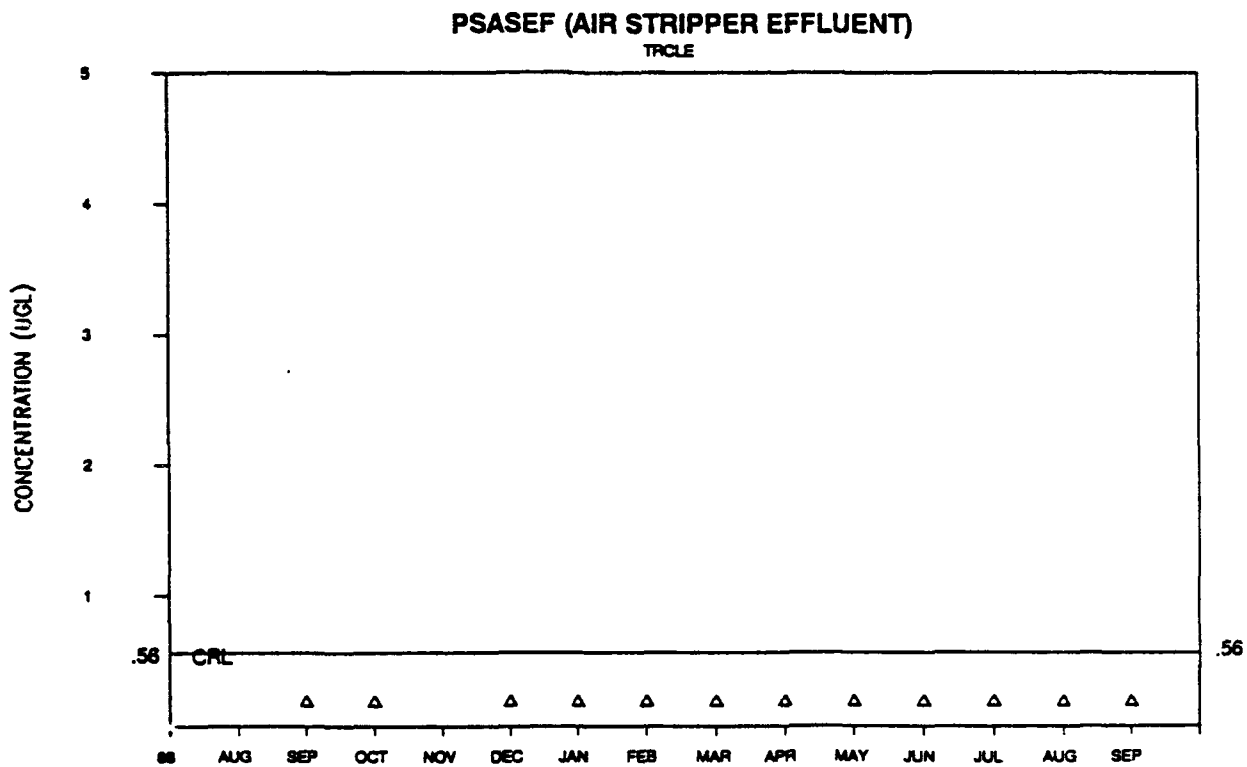
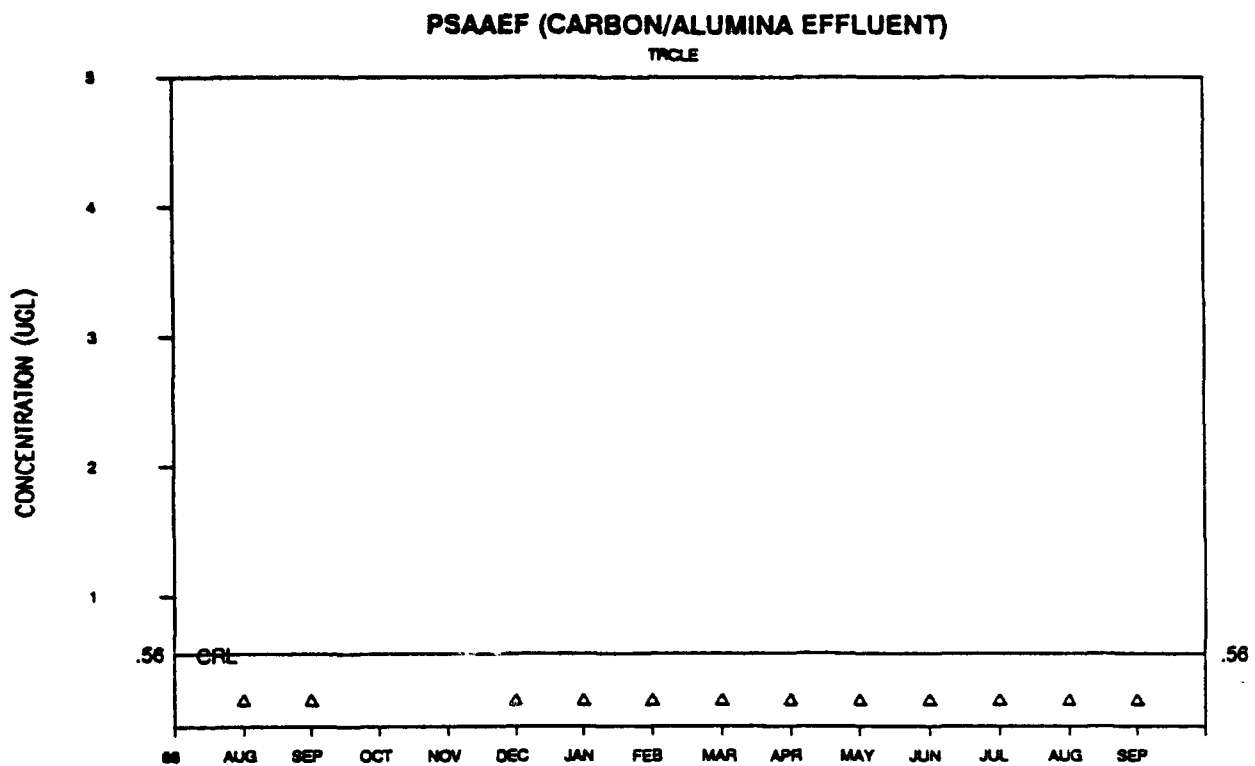


Figure 36. Trichloroethylene (Concluded)

Xylenes

55. The CRL for xylenes (XYLEN) was 1.36 ug/l as indicated in Figure 37. Approximately one half of the system influent samples collected over the study period contained xylenes in excess of the CRL. The maximum concentration found was approximately 7.7 ug/l. None of the samples collected from the carbon/alumina or air stripper effluents contained xylenes in concentrations above the CRL. These results indicate that xylenes were commonly found in the influent to the CPS and that the treatment system was effective in removing them.

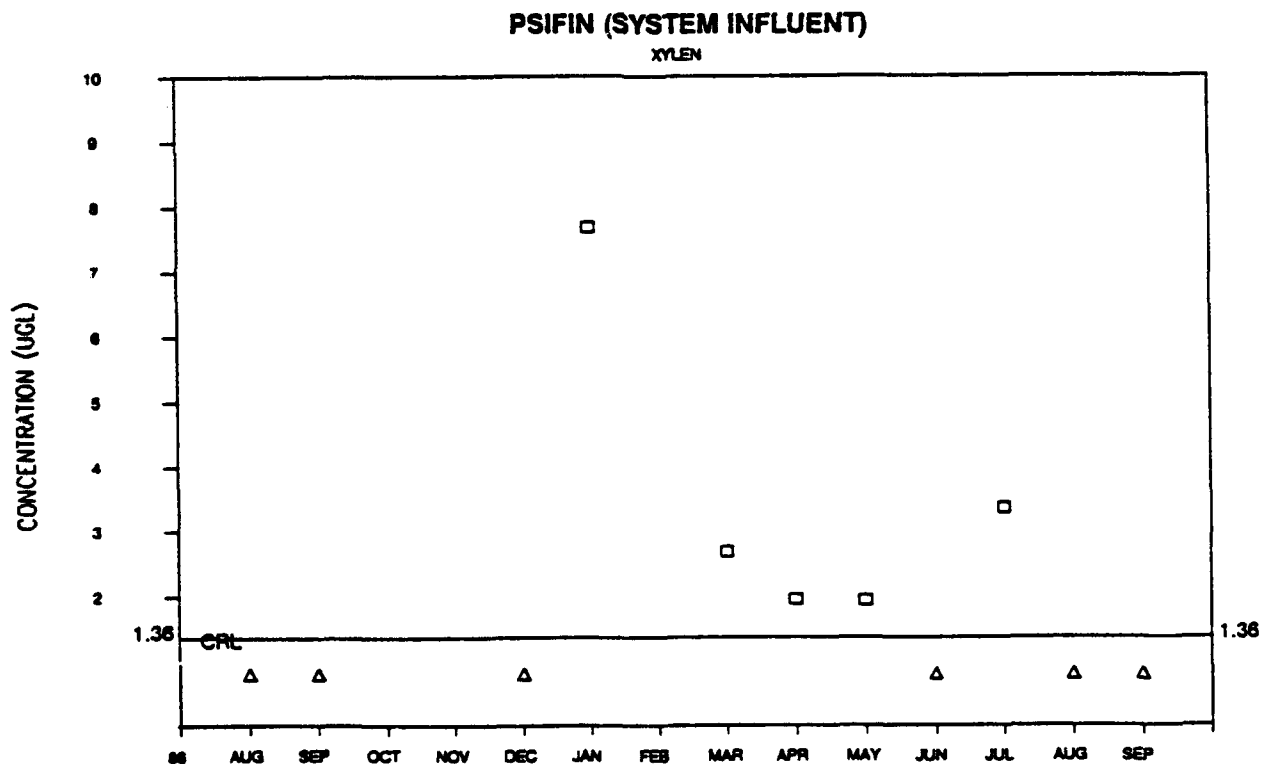
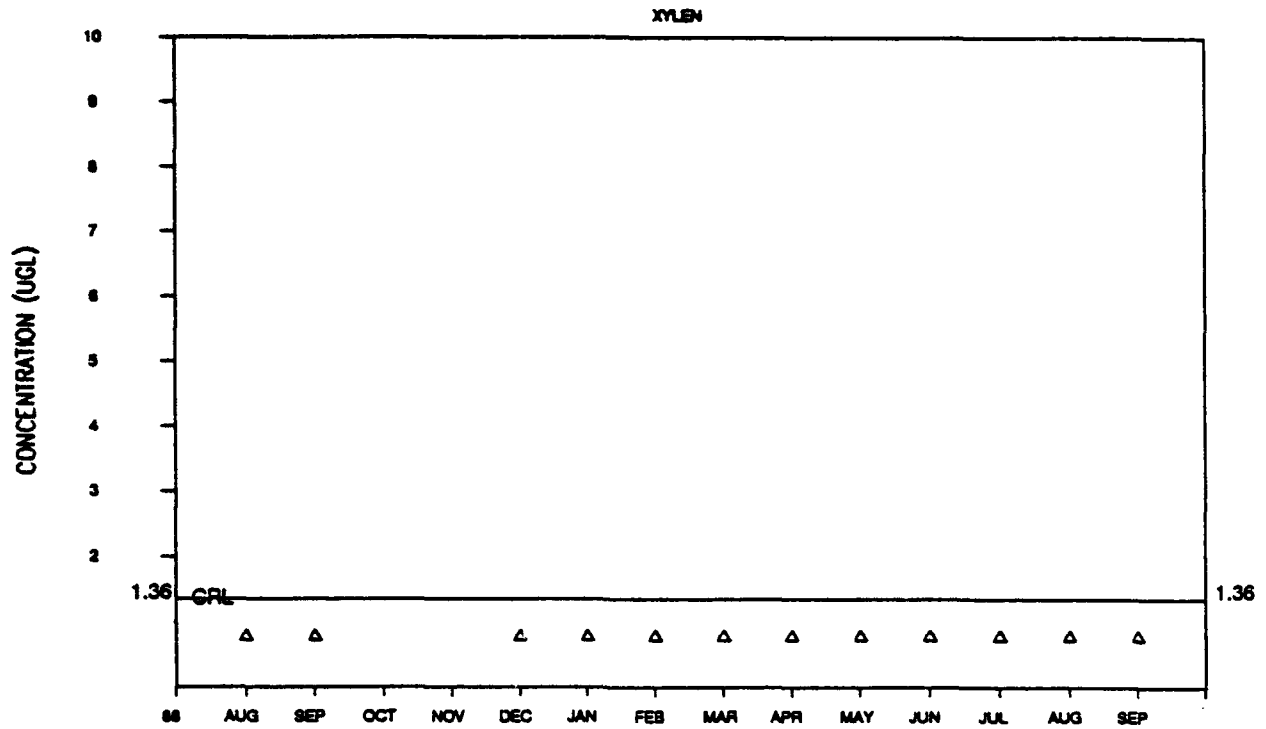


Figure 37. Xylenes Concentrations (Continued)

PSAAEF (CARBON/ALUMINA EFFLUENT)



PSASEF (AIR STRIPPER EFFLUENT)

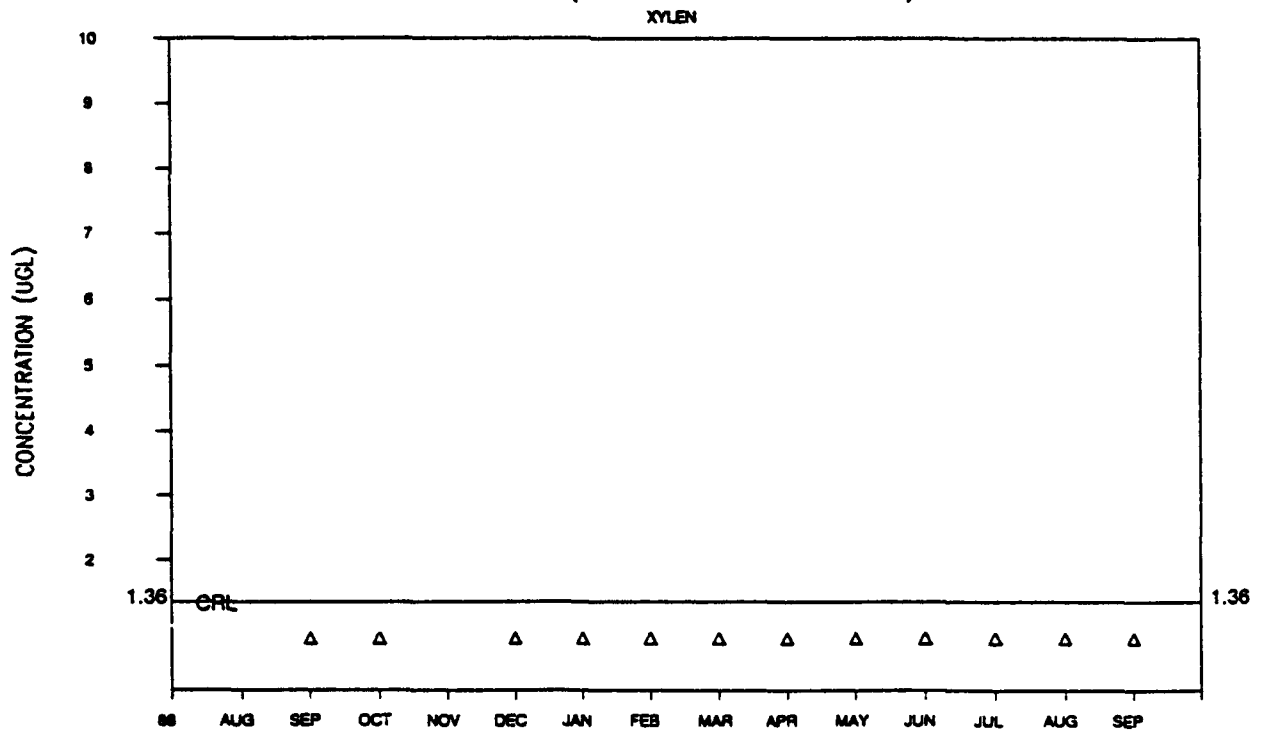


Figure 37. Xylenes (Concluded)

GC/MS Analyses

56. GC/MS analyses were conducted periodically on samples collected from the system influent, carbon/alumina effluent, and air stripper effluent. The results are reproduced in Appendix B. A summary of the analytes identified above their respective detection levels is presented in Table 3. Most of the contaminants identified were in the system influent. Methylene chloride and benzene only were identified in several of the air stripper effluent samples. The majority of the contaminants are routinely analyzed for on a monthly basis. However, several phenolic contaminants were identified in the system influent which are not typically analyzed for. These contaminants were not identified in the air stripper effluent.

57. A comparison of the concentrations of methylene chloride and benzene reported in the air stripper effluent as a result of the GC/MS analyses was made with the concentrations reported for the monthly routine analyses. In all three cases, the concentrations reported for the GC/MS analyses were below the respective CRL's for the monthly routine analyses. In summary, the GC/MS data indicate that the SPTS is in general effectively removing the organic contaminants identified in the influent to the system.

Contaminant Mass Removal

58. A calculation of the total mass of contaminants removed by the SPTS during FY89 was conducted by the Technical Operations Division as part of a multi-year study on all the water treatment systems in operation at RMA. A summary of the results from this study for the SPTS is presented as Table 4. The amount of contaminant removed is given in pounds with a total for the year of approximately 30.6 pounds. The contaminants with the largest amounts removed include acetone, benzene, methylene chloride, and chloroform.

Effectiveness of the Air Stripper

59. The overall effectiveness of the air stripper was difficult to assess during FY89 since in general, the volatile organics in the influent to the plant were reduced to below their respective CRL's by the carbon adsorption process. Thus, very few concentrations of volatile organics above their respective CRL's were reported in the influent to the air stripper. Chloroform was the major contaminant which was found above its CRL in the effluent from the carbon/alumina subsystem (air stripper influent). Chloroform was identified in the effluent from the air stripper early in FY89 (indicating

Table 3

GC/MS Data Summary for the South Plant CERCLA Pretreatment System

Analytes Identified above their Respective Detection Levels

Sample Date	System Influent	Carbon/Alumina Effluent	Air Stripper Effluent
10/04/88	No data	All below det. level	All below det. level
12/01/88	1,1,1-trichloroethane methylene chloride chloroform p-chlorophenylmethyl sulfone diisopropylmethylphosphosate tetrachloroethylene	All below det. level	All below det. level
1/25/89 12/29/89	acetone methylene chloride chloroform	All below det. level methylene chloride	All below det. level methylene chloride
2/22/89	2,4-dimethylphenol 4-methylphenol benzene methylene chloride chloroform p-chlorophenylmethyl sulfone dicyclopentadiene phenol	benzene	benzene
3/29/89 4/26/89	chloroform 4-methylphenol acetone benzene methylene chloride chloroform DIMP phenol	All below det. level All below det. level	All below det. level All below det. level

(Continued)

Table 3. (Concluded)

Sample Date	System Influent	Carbon/Alumina Effluent	Air Stripper Effluent
5/31/89	acetone benzene methylene chloride chloroform p-chlorophenylmethyl sulfone phenol	methylene chloride	methylene chloride
6/27/89	4-methylphenol acetone benzene chloroform p-chlorophenylmethyl sulfone DIMP phenol	All below det. level	All below det. level
7/25/89	2,4-dimethylphenol acetone benzene chloroform p-chlorophenylmethyl sulfone DIMP	All below det. level	All below det. level
8/30/89	p-chlorophenylmethyl sulfone DIMP	All below det. level	All below det. level
9/27/89	All below det. level	All below det. level	All below det. level

Table 4
Contaminant Removal
South Plants CERCLA Pretreatment System
(Influent - Effluent)
1989

SITE: PSIFIN, PSACEF

ANALYTE	UOM	INFLUENT AVG.	EFFLUENT AVG.	INFLUENT- EFFLUENT	FLOW RATE (GALS)	CONVERSION	LBS REMOVED
111TCE	UGL	0.11	0.06	0.05	512,600	0.00000008337	0.0002
13DMB	UGL	0.30	0.00	0.30	512,600	0.00000008337	0.0013
4MP	UGL	3.74	0.00	3.74	512,600	0.00000008337	0.0160
ACET	UGL	2254.00	577.00	1677.00	512,600	0.00000008337	7.1667
ALDRN	UGL	0.19	.00	0.18	512,600	0.00000008337	0.0008
AS	UGL	15.10	10.19	4.91	512,600	0.00000008337	0.0210
ATZ	UGL	4.35	0.00	4.35	512,600	0.00000008337	0.0186
BTZ	UGL	0.60	0.00	0.60	512,600	0.00000008337	0.0026
C6H6	UGL	1941.00	0.04	1940.96	512,600	0.00000008337	8.2948
CH2CL2	UGL	2478.00	21.02	2456.98	512,600	0.00000008337	10.5000
CHCL3	UGL	585.00	0.20	584.80	512,600	0.00000008337	2.4992
CL6CP	UGL	0.06	0.05	0.02	512,600	0.00000008337	0.0001
CLC6H5	UGL	3.91	0.00	3.91	512,600	0.00000008337	0.0167
CLDAN	UGL	1.98	0.00	1.98	512,600	0.00000008337	0.0085
CPMSO	UGL	8.26	0.00	8.26	512,600	0.00000008337	0.0353
CPMSO2	UGL	12.34	3.34	9.00	512,600	0.00000008337	0.0385
CR	UGL	3.79	0.00	3.79	512,600	0.00000008337	0.0162
DBCP	UGL	0.30	0.00	0.30	512,600	0.00000008337	0.0013
DCPD	UGL	23.63	0.00	23.63	512,600	0.00000008337	0.1010
DIMP	UGL	40.31	1.85	38.46	512,600	0.00000008337	0.1644
DITH	UGL	0.31	0.00	0.31	512,600	0.00000008337	0.0013
DLDRN	UGL	0.78	0.05	0.73	512,600	0.00000008337	0.0031
DMDS	UGL	0.10	0.09	0.01	512,600	0.00000008337	0.0001
DMMP	UGL	2.49	1.37	1.12	512,600	0.00000008337	0.0048
ENDRIN	UGL	0.57	0.06	0.52	512,600	0.00000008337	0.0022
ETC6H5	UGL	0.12	0.00	0.12	512,600	0.00000008337	0.0005
F	UGL	1693.00	1468.00	225.00	512,600	0.00000008337	0.9615
HG	UGL	0.62	0.24	0.38	512,600	0.00000008337	0.0016
ISODR	UGL	0.13	0.00	0.13	512,600	0.00000008337	0.0006
MEC6H5	UGL	4.09	0.00	4.09	512,600	0.00000008337	0.0175
MIBK	UGL	3.40	0.00	3.40	512,600	0.00000008337	0.0145
MLTHN	UGL	0.86	0.00	0.86	512,600	0.00000008337	0.0037
PHENOL	UGL	38.40	0.00	38.40	512,600	0.00000008337	0.1641
PPDDE	UGL	0.51	0.02	0.49	512,600	0.00000008337	0.0021
PPDDT	UGL	0.12	0.02	0.11	512,600	0.00000008337	0.0005
PRTHN	UGL	1.68	0.00	1.68	512,600	0.00000008337	0.0072
TCLEE	UGL	1.72	0.00	1.72	512,600	0.00000008337	0.0074

(Continued)

Table 4 (Concluded)

ANALYTE	UOM	INFLUENT AVG.	EFFLUENT AVG.	INFLUENT- EFFLUENT	FLOW RATE (GALS)	CONVERSION	LBS REMOVED
TRCLE	UGL	0.79	0.00	0.79	512,600	0.000000008337	0.0034
XYLEN	UGL	0.93	0.00	0.93	512,600	0.000000008337	0.0040
ZN	UGL	143.00	29.69	113.31	512,600	0.000000008337	<u>0.4842</u> 30.5871

(Source: A Calculation of Contaminant Removal by the Rocky Mountain Arsenal Water Treatment System Operations for FY87, FY88, and FY89. Thomas A. Brooks; TECHNICAL OPERATION Division, Office of PMRMACC).

poor removal) but was effectively removed from the wastestream later in the year.

Carbon/Alumina Usage

60. The CPS plant operation records for FY89 indicate that the alumina in the alumina adsorber was replaced a total of four times during the year. The carbon in the carbon adsorber was replaced twice. No records were maintained on the actual quantities of alumina and carbon used during the year. However, an estimate of the total pounds used during FY89 has been calculated based on the size of the two columns. These calculations indicate that the total usages were approximately 700 pounds of alumina and 1500 pounds of carbon. The corresponding usage ratios are 1.4 pounds of alumina and 2.9 pounds of carbon per thousand gallons of water treated.

PART IV: CONCLUSIONS

61. Based on the evaluation of the available FY89 operations data for the South Plants CERCLA Pretreatment System, the following conclusions can be made:

- a. The CPS generally operated as scheduled with little down time.
- b. The volume of water treated each month ranged from a low of 15,540 gallons to a high of 70,400 gallons.
- c. The CPS was in general, effective in removing organic contaminants. Of the numerous organics found in the influent to the plant, only vapona, DIMP, DMMP, endrin, DDE, and DDT were found above their respective CRL's in some of the effluent samples.
- d. The GC/MS analyses conducted on the influent and effluent of the system identified only several phenolic compounds in the influent to the system that were not being routinely monitored for.
- e. A calculation of the total mass of contaminants removed by the CPS during FY89 indicated a removal of approximately 30.6 pounds.

APPENDIX A:
Treatment Plant Water Quality Data

SOUTH PLANTS WASTEWATER TREATMENT SYSTEM - PSIFIN FOR FY88 & FY89

SAMPLE DATE	111TCE ug/l	112TCE ug/l	11DCE ug/l	11DCLE ug/l	12DCE ug/l	12DCLE ug/l	13DMS ug/l	ALDRN ug/l	AS ug/l
AUG FY88	LT 0.760	LT 0.780	....	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	12.100
SEP FY88	LT 0.760	LT 0.780	....	1.960	LT 0.760	LT 1.100	LT 1.320	0.148	6.177
OCT FY89	....	....	....	....	....	....	....	....	....
NOV FY89	....	....	....	....	....	....	....	....	....
DEC FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	0.302	17.800
JAN FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT .100	2.430	0.117	13.800
FEB FY89	....	....	....	....	....	....	....	0.479	13.800
MAR FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	1.510	LT 0.050	16.800
APR FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	0.129	15.800
MAY FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	1.970	0.083	12.000
JUN FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	....	18.700
JUL FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	14.100
AUG FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	13.100
SEP FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	12.900

LT = LESS THAN The Following Concentration
ug/l = MICROGRAM PER LITER

.... INDICATES THAT ANALYSIS WAS NOT PERFORMED
mg/l = MILLIGRAM PER LITER

SOUTH PLANTS WASTEWATER TREATMENT SYSTEM - PSIFIN FOR FY88 & FY89

SAMPLE DATE	ATZ ug/l	BCHPO ug/l	BTZ ug/l	C6H6 ug/l	CCL4 ug/l	CH2CL2 ug/l	CHCL3 ug/l	CHLORIDE mg/l	CL6CP ug/l
AUG FY88	LT 4.030	....	8.940	2.810	LT 0.990	LT 7.400	31.300	150	LT 0.048
SEP FY88	4.790	LT 5.900	8.310	LT 1.050	LT 0.990	37.740	15.900	143	LT 0.048
OCT FY89	....	....	....	....	....	....	....	....	....
NOV FY89	....	....	....	....	....	....	....	....	....
DEC FY89	6.610	LT 5.900	LT 5.000	LT 1.050	LT 0.990	100	81.400	125	0.060
JAN FY89	9.950	LT 5.900	LT 5.000	17.500	LT 0.990	....	....	120	LT 0.048
FEB FY89	....	LT 5.900	LT 5.000	....	....	....	....	190	0.525
MAR FY89	10.500	LT 5.900	LT 5.000	....	LT 0.990	....	....	120	....
APR FY89	LT 4.030	LT 5.900	LT 5.000	....	LT 0.990	....	....	120	LT 0.048
MAY FY89	LT 4.030	LT 5.900	LT 5.000	....	LT 0.990	54.500	148	100	LT 0.048
JUN FY89	12.100	LT 5.900	5.990	15.100	LT 0.990	26.500	4.180	110	....
JUL FY89	5.490	LT 5.900	LT 5.000	LT 1.050	LT 0.990	LT 7.400	23.400	96.000	LT 0.048
AUG FY89	LT 5.900	LT 5.000	2.010	LT 0.990	122	140	0.062
SEP FY89	9.680	LT 5.900	LT 5.000	LT 1.050	LT 0.990	71.000	47.600	85.000	0.146

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SOUTH PLANTS WASTEWATER TREATMENT PLANT - PSIFIN FOR FY88 & FY89

SAMPLE DATE	CLC6H5 ug/l	CLDAM ug/l	CPMS ug/l	CPMSO ug/l	CPMSO2 ug/l	DBCP ug/l	DCPD ug/l	DDVP ug/l	DIMP ug/l
AUG FY88	10.600	LT 0.095	LT 5.690	....	30.100	LT 0.195	....	LT 0.500	....
SEP FY88	3.168	LT 0.095	LT 5.690	40.630	21.333	LT 0.195	LT 5.000	0.690	86.925
OCT FY89	....	....	....	....	....	....	....	....	....
NOV FY89	....	....	....	....	....	....	....	....	....
DEC FY89	LT 0.820	....	LT 5.690	27.450	13.330	LT 0.195	10.350	LT 0.384	56.200
JAN FY89	37.800	LT 0.095	LT 5.690	LT 11.500	15.900	1.510	LT 5.000	LT 0.384	59.600
FEB FY89	....	1.210	LT 5.690	LT 11.500	9.830	2.320	....	....	39.300
MAR FY89	4.690	0.443	LT 5.690	38.400	LT 7.460	0.426	9.220	19.100	41.100
APR FY89	....	....	LT 5.690	35.500	9.570	LT 0.195	10.600	3.000	28.200
MAY FY89	1.780	LT 0.095	LT 5.690	LT 11.500	LT 7.460	0.396	LT 5.000	LT 0.384	33.900
JUN FY89	LT 0.820	....	LT 5.690	....	24.700	0.203	11.500	LT 0.384	27.400
JUL FY89	LT 0.820	1.210	LT 5.690	LT 11.500	26.900	LT 0.195	11.000	LT 0.384	50.000
AUG FY89	LT 0.820	0.395	LT 5.690	14.800	8.340	LT 0.195	LT 5.000
SEP FY89	LT 0.820	0.819	LT 5.690	LT 11.500	19.900	LT 0.195	LT 5.000	LT 0.384	34.400

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SOUTH PLANTS WASTEWATER TREATMENT PLANT - PSIFIN FOR FY88 & FY89

SAMPLE DATE	DITH ug/l	DLDRN ug/l	DMS ug/l	DMMP ug/l	ENDRN ug/l	ETC6H5 ug/l	FLUORIDE mg/l	ISODR ug/l	MEC6H5 ug/l
AUG FY88	13.700	0.437	LT 0.550	....	0.095	LT 1.370	1.750	0.195	LT 1.470
SEP FY88	8.870	0.450	LT 0.550	....	0.219	LT 1.370	1.548	0.122	LT 1.470
OCT FY89	....	....	....	....	....	....	....	....	....
NOV FY89	....	....	....	....	....	....	....	....	....
DEC FY89	LT 1.340	....	LT 0.550	....	....	LT 1.370	2.250	0.140	LT 1.470
JAN FY89	LT 1.340	....	LT 0.550	....	....	2.250	1.930	LT 0.051	13.500
FEB FY89	LT 1.340	....	LT 0.550	....	0.347	....	3.210	0.265	....
MAR FY89	LT 1.340	....	LT 0.550	....	0.323	LT 1.370	1.590	LT 0.051	4.870
APR FY89	LT 1.340	....	LT 0.550	2.170	0.286	LT 1.370	1.700	0.388	6.830
MAY FY89	LT 1.340	....	LT 0.550	1.510	0.249	LT 1.370	1.110	0.108	3.450
JUN FY89	2.610	....	LT 0.550	1.860	....	LT 1.370	1.660	....	LT 1.470
JUL FY89	2.360	....	LT 0.550	1.700	0.287	LT 1.370	1.270	0.158	LT 1.470
AUG FY89	LT 1.340	0.088	LT 0.550	17.700	0.419	LT 1.370	1.540	LT 0.051	LT 1.470
SEP FY89	LT 1.340	0.284	LT 0.550	14.400	0.298	LT 1.370	1.030	LT 0.051	LT 1.470

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SOUTH PLANTS WASTEWATER TREATMENT PLANT - PSIFIN FOR FY88 & FY89

SAMPLE DATE	MIBK ug/l	MLTHN ug/l	OXAT ug/l	PPDE ug/l	PPDT ug/l	PRTHN ug/l	SO4 mg/l	SUPONA ug/l	TCLEE ug/l
AUG FY88	....	LT 0.500	LT 2.380	LT 0.054	0.138	LT 0.647	....	LT 0.787	1.550
SEP FY88	LT 4.900	0.755	LT 2.380	0.055	0.080	0.865	....	LT 0.787	1.022
OCT FY89	....	....	....	....	....	....	....	....	....
NOV FY89	....	....	....	....	....	....	....	....	....
DEC FY89	23.900	2.490	LT 2.380	0.802	0.456	1.550	....	LT 0.787	3.910
JAN FY89	8.400	LT 0.373	LT 2.380	0.165	LT 0.049	LT 0.647	180	LT 0.787	3.860
FEB FY89	LT 4.900	....	LT 2.380	0.101	0.253	....	....	....	....
MAR FY89	LT 4.900	2.100	LT 2.380	LT 0.054	LT 0.049	1.720	....	LT 0.787	2.960
APR FY89	LT 4.900	LT 0.373	LT 2.380	0.363	0.343	LT 0.647	140	LT 0.787	....
MAY FY89	LT 4.900	3.390	LT 2.380	LT 0.054	LT 0.049	LT 0.647	150	LT 0.787	2.310
JUN FY89	LT 4.900	LT 0.373	LT 2.380	....	LT 0.049	20.400	130	LT 0.787	LT 0.750
JUL FY89	LT 4.900	0.884	LT 2.380	0.217	LT 0.049	LT 0.647	150	LT 0.787	1.090
AUG FY89	13.300	LT 2.380	0.089	0.450	LT 0.647	200	3.620
SEP FY89	LT 4.900	0.744	LT 2.380	LT 0.054	LT 0.049	LT 0.647	140	LT 0.787	3.150

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SOUTH PLANTS WASTEWATER TREATMENT PLANT - PSIFIN FOR FY88 & FY89

SAMPLE DATE		TRCLE ug/l		XYLEN ug/l
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AUG FY88	LT	0.560	LT	1.360
SEP FY88	LT	0.560	LT	1.360
OCT FY89	
NOV FY89	
DEC FY89	LT	0.560	LT	1.360
JAN FY89		1.750		7.680
FEB FY89		....		....
MAR FY89		1.360		2.680
APR FY89		....		1.950
MAY FY89	LT	0.560		1.930
JUN FY89	LT	0.560	LT	1.360
JUL FY89	LT	0.560		3.350
AUG FY89	LT	0.560	LT	1.360
SEP FY89	LT	0.560	LT	1.360

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SOUTH PLANTS WASTEWATER TREATMENT SYSTEM - PSAAEF FOR FY88 & FY89

SAMPLE DATE	111TCE ug/l	112TCE ug/l	11DCE ug/l	11DCLE ug/l	12DCE ug/l	12DCLE ug/l	13DMS ug/l	ALDRIN ug/l	AS ug/l
AUG FY88	LT 0.760	LT 0.780	....	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	7.670
SEP FY88	LT 0.760	LT 0.780	....	LT 0.730	LT 0.760	LT 1.100	LT 1.320	0.091	4.368
OCT FY89	....	....	....	....	....	....	....	....	....
NOV FY89	....	....	....	....	....	....	....	....	....
DEC FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	0.055	17.000
JAN FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	13.100
FEB FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	7.700
MAR FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	2.830
APR FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	7.830
MAY FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	2.900
JUN FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	0.275	3.655
JUL FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	3.660
AUG FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	7.000
SEP FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	4.000

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SOUTH PLANTS WASTEWATER TREATMENT SYSTEM - PSAAEF FOR FY88 & FY89

SAMPLE DATE	ATZ ug/l	BCHPO ug/l	BTZ ug/l	C6H6 ug/l	CCL4 ug/l	CH2CL2 ug/l	CHCL3 ug/l	CHLORIDE mg/l	CL6CP ug/l
AUG FY88	LT 4.030	....	LT 5.000	LT 1.050	LT 0.990	LT 7.400	LT 0.500	150	LT 0.048
SEP FY88	LT 4.030	LT 5.900	LT 5.000	LT 1.050	LT 0.990	LT 7.400	LT 0.500	140	LT 0.048
OCT FY89	....	....	....	....	....	....	....	....	....
NOV FY89	....	....	....	....	....	....	....	....	....
DEC FY89	LT 4.030	LT 5.900	LT 5.000	LT 1.050	LT 0.990	14.900	3.110	225	LT 0.048
JAN FY89	LT 4.030	LT 5.900	LT 5.000	LT 1.050	LT 0.990	LT 7.400	LT 0.500	130	LT 0.048
FEB FY89	....	LT 5.900	6.300	LT 1.050	LT 0.990	....	LT 0.500	180	0.090
MAR FY89	LT 4.030	LT 5.900	LT 5.000	LT 1.050	LT 0.990	....	LT 0.500	120	....
APR FY89	LT 4.030	LT 5.900	LT 5.000	LT 1.050	LT 0.990	....	LT 0.500	110	LT 0.048
MAY FY89	....	LT 5.900	LT 5.000	LT 1.050	LT 0.990	47.000	LT 0.500	100	LT 0.048
JUN FY89	LT 4.030	LT 5.900	LT 5.000	LT 1.050	LT 0.990	....	LT 0.500	110	....
JUL FY89	LT 4.030	LT 5.900	LT 5.000	LT 1.050	LT 0.990	LT 7.400	3.730	96.000	LT 0.048
AUG FY89	LT 5.900	LT 5.000	LT 1.050	LT 0.990	LT 7.400	0.718	130	0.062
SEP FY89	LT 4.030	LT 5.900	LT 5.000	LT 1.050	LT 0.990	LT 7.400	LT 0.500	85.000	0.182

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SOUTH PLANTS WASTEWATER TREATMENT PLANT - PSAAEF FOR FY88 & FY89

SAMPLE DATE	CLC6H5 ug/l	CLDAN ug/l	CPMS ug/l	CPMSO ug/l	CPMSO2 ug/l	D8CP ug/l	DCPD ug/l	DDVP ug/l	DIMP ug/l
AUG FY88	LT 0.820	LT 0.095	LT 5.690	52.400	LT 7.460	LT 0.195	....	LT 0.500	LT 0.650
SEP FY88	LT 0.820	LT 0.095	LT 5.690	LT 11.500	LT 7.460	LT 0.195	LT 5.000	LT 0.500	1.350
OCT FY89	....	....	....	....	....	....	....	....	....
NOV FY89	....	....	....	....	....	....	....	....	....
DEC FY89	LT 0.820	LT 0.095	LT 5.690	LT 11.500	LT 7.460	LT 0.195	LT 5.000	LT 0.384	8.360
JAN FY89	LT 0.820	LT 0.095	LT 5.690	LT 11.500	LT 7.460	LT 0.195	LT 5.000	LT 0.384	LT 0.650
FEB FY89	LT 0.820	LT 0.095	LT 5.690	15.500	LT 7.460	LT 0.195	LT 5.000	....	LT 0.650
MAR FY89	LT 0.820	LT 0.095	LT 5.690	47.400	LT 7.460	LT 0.195	LT 5.000	LT 0.384	LT 0.650
APR FY89	LT 0.820	LT 0.095	LT 5.690	22.300	8.230	LT 0.195	LT 5.000	LT 0.384	LT 0.392
MAY FY89	LT 0.820	LT 0.095	LT 5.690	LT 11.500	LT 7.460	LT 0.195	LT 5.000	....	LT 0.392
JUN FY89	LT 0.820	LT 0.095	LT 5.690	LT 11.500	65.500	LT 0.195	LT 5.000	LT 0.384	LT 0.392
JUL FY89	LT 0.820	LT 0.095	LT 5.690	LT 11.500	17.400	LT 0.195	LT 5.000	LT 0.384	LT 0.392
AUG FY89	LT 0.320	LT 0.095	LT 5.690	25.000	23.800	LT 0.195	LT 5.000	8.360
SEP FY89	LT 0.820	LT 0.095	LT 5.690	LT 11.500	45.800	LT 0.195	LT 5.000	LT 0.384	5.690

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SOUTH PLANTS WASTEWATER TRESTMENT PLANT - PSAAEF FOR FY88 & FY89

SAMPLE DATE	DITH ug/l	DLDRN ug/l	DMDS ug/l	DMMP ug/l	ENDRN ug/l	ETC6H5 ug/l	FLUORIDE mg/l	ISODR ug/l	MEC6H5 ug/l
AUG FY88	LT 1.340	LT 0.050	LT 0.550	....	LT 0.050	LT 1.370	1.700	LT 0.051	LT 1.470
SEP FY88	LT 1.340	0.057	LT 0.550	....	LT 0.050	LT 1.370	1.093	LT 0.051	LT 1.470
OCT FY89	....	....	....	....	....	....	....	....	....
NOV FY89	....	....	....	....	....	....	....	....	....
DEC FY89	LT 1.340	LT 0.050	LT 0.550	....	0.079	LT 1.370	2.310	LT 0.051	LT 1.470
JAN FY89	LT 1.340	0.046	LT 0.550	....	LT 0.050	LT 1.370	1.770	LT 0.051	LT 1.470
FEB FY89	LT 1.340	LT 0.050	LT 0.550	....	LT 0.050	LT 1.370	1.760	LT 0.051	LT 1.470
MAR FY89	LT 1.340	LT 0.050	LT 0.550	....	LT 0.050	LT 1.370	1.490	LT 0.051	LT 1.470
APR FY89	LT 1.340	LT 0.050	LT 0.550	LT 0.188	LT 0.050	LT 1.370	1.710	LT 0.051	LT 1.470
MAY FY89	LT 1.340	LT 0.050	LT 0.550	LT 0.188	LT 0.050	LT 1.370	1.090	LT 0.051	LT 1.470
JUN FY89	LT 1.340	....	LT 0.550	LT 0.188	....	LT 1.370	1.960	....	LT 1.470
JUL FY89	LT 1.340	LT 0.050	LT 0.550	3.450	LT 0.050	LT 1.370	1.350	LT 0.051	LT 1.470
AUG FY89	LT 1.340	LT 0.050	LT 0.550	9.790	LT 0.050	LT 1.370	1.400	LT 0.051	LT 1.470
SEP FY89	LT 1.340	LT 0.050	LT 0.550	12.900	LT 0.050	LT 1.370	0.426	LT 0.051	LT 1.470

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SOUTH PLANTS WASTEWATER TREATMENT PLANT - PSAAEF FOR FY88 & FY89

SAMPLE DATE	MIBK ug/l	MLTHM ug/l	OXAT ug/l	PPODE ug/l	PPDOT ug/l	PRTHN ug/l	SO4 mg/l	SUPONA ug/l	TCLEE ug/l
AUG FY88	....	LT 0.500	LT 2.380	LT 0.054	0.105	LT 0.647	....	LT 0.787	LT 0.750
SEP FY88	LT 4.900	1.087	LT 2.380	LT 0.054	0.058	LT 0.647	....	LT 0.787	LT 0.750
OCT FY89	....	....	....	....	....	....	....	....	....
NOV FY89	....	....	....	....	....	....	....	....	....
DEC FY89	LT 4.900	LT 0.373	LT 2.380	LT 0.054	LT 0.049	LT 0.647	....	LT 0.787	LT 0.750
JAN FY89	LT 4.900	LT 0.373	LT 2.380	LT 0.054	LT 0.049	LT 0.647	....	LT 0.787	LT 0.750
FEB FY89	LT 4.900	....	LT 2.380	LT 0.054	LT 0.049	....	....	....	LT 0.750
MAR FY89	LT 4.900	LT 0.373	LT 2.380	LT 0.054	LT 0.049	LT 0.647	....	LT 0.787	LT 0.750
APR FY89	LT 4.900	LT 0.373	LT 2.380	LT 0.054	LT 0.049	LT 0.647	140	LT 0.787	LT 0.750
MAY FY89	LT 4.900	....	LT 2.380	LT 0.054	LT 0.049	....	140	....	LT 0.750
JUN FY89	LT 4.900	LT 0.373	LT 2.330	....	....	LT 0.647	120	LT 0.787	LT 0.750
JUL FY89	LT 4.900	0.708	LT 2.380	LT 0.054	LT 0.049	LT 0.647	140	LT 0.787	LT 0.750
AUG FY89	LT 4.900	LT 2.380	LT 0.054	LT 0.049	7.870	190	LT 0.750
SEP FY89	LT 4.900	LT 0.373	LT 2.380	LT 0.054	LT 0.049	LT 0.647	140	LT 0.787	LT 0.750

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SOUTH PLANTS WASTEWATER TREATMENT PLANT - PSAAEF FOR FY88 & FY89

SAMPLE DATE		TRCLE ug/l		XYLEN ug/l
AUG FY88	LT	0.560	LT	1.360
SEP FY88	LT	0.560	LT	1.360
OCT FY89		....		....
NOV FY89		....		....
DEC FY89	LT	0.560	LT	1.360
JAN FY89	LT	0.560	LT	1.360
FEB FY89	LT	0.560	LT	1.360
MAR FY89	LT	0.560	LT	1.360
APR FY89	LT	0.560	LT	1.360
MAY FY89	LT	0.560	LT	1.360
JUN FY89	LT	0.560	LT	1.360
JUL FY89	LT	0.560	LT	1.360
AUG FY89	LT	0.560	LT	1.360
SEP FY89	LT	0.560	LT	1.360

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SOUTH PLANTS WASTEWATER TREATMENT SYSTEM - PSASEF FOR FY88 & FY89

SAMPLE DATE	111TCE ug/l	112TCE ug/l	110CE ug/l	110CLE ug/l	120CE ug/l	120CLE ug/l	130MB ug/l	ALDRN ug/l	AS ug/l
AUG FY	....	....	....	....	....	....	....	....	....
SEP FY88	LT 0.760	LT 0.780	....	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	2.640
OCT FY89	LT 0.760	LT 0.780	....	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	2.720
NOV FY89	....	....	....	....	....	....	....	....	....
DEC FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	0.055	23.900
JAN FY89	1.400	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	14.300
FEB FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	8.990
MAR FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	7.050
APR FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	8.350
MAY FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	4.630
JUN FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	....
JUL FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	4.560
AUG FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	LT 0.050	9.700
SEP FY89	LT 0.760	LT 0.780	LT 1.700	LT 0.730	LT 0.760	LT 1.100	LT 1.320	....	4.740

LT = LESS THAN The Following Concentration
ug/l = MICROGRAM PER LITER

.... INDICATES THAT ANALYSIS WAS NOT PERFORMED
mg/l = MILLIGRAM PER LITER

SOUTH PLANTS WASTEWATER TREATMENT SYSTEM - PSASEF FOR FY88 & FY89

SAMPLE DATE	ATZ ug/l	BCHPO ug/l	BTZ ug/l	C6H6 ug/l	CCL4 ug/l	CH2CL2 ug/l	CHCL3 ug/l	CHLORIDE mg/l	CL6CP ug/l
AUG FY88	....	....	....	....	....	....	....	....	....
SEP FY88	LT 4.030	LT 5.900	....	LT 1.050	LT 0.990	LT 7.400	LT 0.500	124	LT 0.048
OCT FY89	LT 4.030	LT 5.900	....	LT 1.050	LT 0.990	LT 7.400	LT 0.500	100	LT 0.048
NOV FY89	....	....	....	....	....	....	....	....	....
DEC FY89	LT 4.030	LT 5.900	LT 5.000	LT 1.050	LT 0.990	LT 7.400	2.405	135	LT 0.048
JAN FY89	LT 4.030	LT 5.900	LT 5.000	LT 1.050	LT 0.990	LT 7.400	LT 0.500	140	LT 0.048
FEB FY89	....	....	LT 5.000	LT 1.050	LT 0.990	LT 7.400	LT 0.500	130	0.070
MAR FY89	LT 4.030	LT 5.900	LT 5.000	LT 1.050	LT 0.990	LT 7.400	LT 0.500	120	....
APR FY89	LT 4.030	LT 5.900	LT 5.000	LT 1.050	LT 0.990	LT 7.400	LT 0.500	120	LT 0.048
MAY FY89	....	LT 5.900	LT 5.000	LT 1.050	LT 0.990	LT 7.400	LT 0.500	110	LT 0.048
JUN FY89	LT 4.030	LT 5.900	LT 5.000	LT 1.050	LT 0.990	LT 7.400	LT 0.500	120	....
JUL FY89	LT 4.030	LT 5.900	LT 5.000	LT 1.050	LT 0.990	LT 7.400	LT 0.500	100	LT 0.048
AUG FY89	....	LT 5.900	LT 5.000	LT 1.050	LT 0.990	LT 7.400	LT 0.500	140	LT 0.048
SEP FY89	LT 4.030	LT 5.900	LT 5.000	LT 1.050	LT 0.990	LT 7.400	LT 0.500	89.000

LT = LESS THAN The Following Concentration
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SOUTH PLANTS WASTEWATER TREATMENT PLANT - PSASEF FOR FY88 & FY89

SAMPLE DATE	CLC6H5 ug/l	CLDAN ug/l	CPHS ug/l	CPHSO mg/l	CPHSO2 ug/l	DBCP ug/l	DCPD ug/l	DOVP ug/l	DIMP ug/l
AUG FY	....	....	....	....	....	....	....	....	....
SEP FY88	LT 0.820	LT 0.095	LT 5.690	LT 11.500	LT 7.460	LT 0.195	LT 5.000	5.834	1.857
OCT FY89	LT 0.820	LT 0.095	LT 5.690	LT 11.500	LT 7.460	LT 0.195	LT 5.000	LT 0.384	LT 0.650
NOV FY89	....	....	....	....	....	....	....	....	....
DEC FY89	LT 0.820	LT 0.095	LT 5.690	LT 11.500	LT 7.460	LT 0.195	LT 5.000	LT 0.384	8.310
JAN FY89	LT 0.820	LT 0.095	LT 5.690	LT 11.500	LT 7.460	LT 0.195	LT 5.000	LT 0.384	1.460
FEB FY89	LT 0.820	LT 0.095	LT 5.690	LT 11.500	LT 7.460	LT 0.195	....	....	LT 0.650
MAR FY89	LT 0.820	LT 0.095	LT 5.690	LT 11.500	LT 7.460	LT 0.195	LT 5.000	....	LT 0.650
APR FY89	LT 0.820	LT 0.095	LT 5.690	LT 11.500	LT 7.460	LT 0.195	LT 5.000	5.480	LT 0.392
MAY FY89	LT 0.820	LT 0.095	LT 5.690	LT 11.500	LT 7.460	LT 0.195	LT 5.000	....	0.466
JUN FY89	LT 0.820	LT 0.095	LT 5.690	LT 11.500	....	LT 0.195	LT 5.000	LT 0.384	LT 0.392
JUL FY89	LT 0.820	LT 0.095	LT 5.690	LT 11.500	LT 7.460	LT 0.195	LT 5.000	LT 0.384	LT 0.392
AUG FY89	LT 0.820	LT 0.095	LT 5.690	LT 11.500	56.800	LT 0.195	LT 5.000	11.100
SEP FY89	LT 0.820	LT 5.690	LT 11.500	LT 7.460	LT 0.195	LT 5.000	48.700	6.100

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SOUTH PLANTS WASTEWATER TREATMENT PLANT - PSASEF FOR FY88 & FY89

SAMPLE DATE	DITH ug/l	DLDRN ug/l	DMDS ug/l	DMMP ug/l	ENDRN ug/l	ETC6H5 ug/l	FLUORIDE mg/l	ISODR ug/l	MEC6H5 ug/l
AUG FY	....	....	....	....	....	....	....	....	....
SEP FY88	LT 1.340	LT 0.050	LT 0.550	....	LT 0.050	LT 1.370	1.228	LT 0.051	LT 1.470
OCT FY89	LT 1.340	LT 0.050	LT 0.550	....	LT 0.050	LT 1.370	0.931	LT 0.051	LT 1.470
NOV FY89	....	....	....	....	....	....	....	....	....
DEC FY89	LT 1.340	LT 0.050	LT 0.550	....	0.065	LT 1.370	2.435	LT 0.051	LT 1.470
JAN FY89	LT 1.340	LT 0.050	LT 0.550	....	LT 0.050	LT 1.370	1.830	LT 0.051	LT 1.470
FEB FY89	LT 1.340	0.089	0.991	....	LT 0.050	LT 1.370	1.660	LT 0.051	LT 1.470
MAR FY89	LT 1.340	LT 0.050	LT 0.550	....	LT 0.050	LT 1.370	1.410	LT 0.051	LT 1.470
APR FY89	LT 1.340	LT 0.050	LT 0.550	0.601	LT 0.050	LT 1.370	1.780	LT 0.051	LT 1.470
MAY FY89	LT 1.340	LT 0.050	LT 0.550	LT 0.188	LT 0.050	LT 1.370	1.150	LT 0.051	LT 1.470
JUN FY89	LT 1.340	LT 0.050	LT 0.550	LT 0.188	0.088	LT 1.370	2.060	LT 0.051	LT 1.470
JUL FY89	LT 1.340	0.539	LT 0.550	3.330	LT 0.050	LT 1.370	1.260	LT 0.051	LT 1.470
AUG FY89	LT 1.340	0.145	LT 0.550	9.760	0.672	LT 1.370	1.400	LT 0.051	LT 1.470
SEP FY89	LT 1.340	LT 0.550	14.900	LT 1.370	0.729	LT 1.470

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SOUTH PLANTS WASTEWATER TREATMENT PLANT - PSASEF FOR FY88 & FY89

SAMPLE DATE	NIBK ug/l	MLTHN ug/l	OXAT ug/l	PPDE ug/l	PPDT ug/l	PRTHN ug/l	SO4 mg/l	SUPONA ug/l	TCLEE ug/l
AUG FY	....	....	....	....	....	....	....	....	....
SEP FY88	LT 4.900	0.512	LT 2.380	LT 0.054	LT 0.049	0.681	....	0.807	LT 0.750
OCT FY89	LT 4.900	LT 0.373	LT 2.380	LT 0.054	LT 0.049	LT 0.647	....	LT 0.787	LT 0.750
NOV FY89	....	....	....	....	....	....	....	....	....
DEC FY89	LT 4.900	LT 0.373	LT 2.380	LT 0.054	LT 0.049	LT 0.647	....	LT 0.787	LT 0.750
JAN FY89	LT 4.900	LT 0.373	LT 2.380	LT 0.054	LT 0.049	LT 0.647	180	LT 0.787	LT 0.750
FEB FY89	....	....	LT 2.380	LT 0.054	LT 0.049	....	....	....	LT 0.750
MAR FY89	LT 4.900	LT 0.373	LT 2.380	LT 0.054	LT 0.049	LT 0.647	....	LT 0.787	LT 0.750
APR FY89	LT 4.900	LT 0.373	LT 2.380	LT 0.054	LT 0.049	LT 0.647	140	1.910	LT 0.750
MAY FY89	LT 4.900	....	LT 2.380	LT 0.054	LT 0.049	....	140	....	LT 0.750
JUN FY89	LT 4.900	LT 0.373	LT 2.380	0.242	0.085	LT 0.647	150	LT 0.787	LT 0.750
JUL FY89	LT 4.900	LT 0.373	LT 2.380	LT 0.054	LT 0.049	LT 0.647	150	LT 0.787	LT 0.750
AUG FY89	LT 4.900	LT 2.380	0.101	0.155	LT 0.647	190	LT 0.750
SEP FY89	LT 4.900	LT 0.373	LT 2.380	LT 0.647	170	LT 0.787	LT 0.750

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mg/l = MILLIGRAM PER LITER

SOUTH PLANTS WASTEWATER TREATMENT PLANT - PSASEF FOR FY88 & FY89

SAMPLE DATE	TRCLE ug/l	XYLEN ug/l
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AUG FY
SEP FY88 LT	0.560	LT 1.360
OCT FY89 LT	0.560	LT 1.360
NOV FY89
DEC FY89 LT	0.560	LT 1.360
JAN FY89 LT	0.560	LT 1.360
FEB FY89 LT	0.560	LT 1.360
MAR FY89 LT	0.560	LT 1.360
APR FY89 LT	0.560	LT 1.360
MAY FY89 LT	0.560	LT 1.360
JUN FY89 LT	0.560	LT 1.360
JUL FY89 LT	0.560	LT 1.360
AUG FY89 LT	0.560	LT 1.360
SEP FY89 LT	0.560	LT 1.360

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mg/l = MILLIGRAM PER LITER

D.P.A.

08/28/90

DATACHEM
FY 89 STATISTICAL SUMMARY
SOUTH TREATMENT PLANT

SITE: PSIFIN

ANALYTE	TOT SAMP	SAMP >CRL	% > CRL	MTH NO.	CERTIFIED REPORT LIMIT (LT)	UOM	MEAN	LOW VALUE	HIGH VALUE
111TCE	11	0	0%	N8	0.76	UGL	LT CRL	LT CRL	LT CRL
112TCE	11	0	0%	N8	0.78	UGL	LT CRL	LT CRL	LT CRL
11DCE	9	0	0%	N8	1.70	UGL	LT CRL	LT CRL	LT CRL
11DCLE	11	1	9%	N8	0.73	UGL	LT CRL	LT CRL	1.96
12DCE	11	0	0%	N8	0.76	UGL	LT CRL	LT CRL	LT CRL
12DCLE	11	0	0%	N8	1.10	UGL	LT CRL	LT CRL	LT CRL
13DMB	11	3	27%	AV8	1.32	UGL	LT CRL	LT CRL	2.43
ALDRN	11	6	55%	KK8	0.05	UGL	LT CRL	LT CRL	0.48
AS	12	12	100%	AX8		UGL	13.92	6.18	18.70
ATZ	10	7	70%	UH11	4.03	UGL	7.12	LT CRL	12.10
BCHPD	11	0	0%	P8	5.90	UGL	LT CRL	LT CRL	LT CRL
BTZ	12	3	25%	AAA8	5.00	UGL	LT CRL	LT CRL	8.94
C6H6	8	4	50%	AV8	1.05	UGL	LT CRL	LT CRL	17.50
CCL4	11	0	0%	N8	0.99	UGL	LT CRL	LT CRL	LT CRL
CH2CL2	8	6	75%	N8	7.40	UGL	53.32	LT CRL	122.00
CHCL3	7	7	100%	N8		UGL	50.25	4.18	148.00
CL	12	12	100%	HH8A, TT09		MGL	124.92	85.00	190.00
CL6CP	10	4	40%	KK8	0.05	UGL	LT CRL	LT CRL	0.53
CLC6H5	10	5	50%	N8	0.82	UGL	LT CRL	LT CRL	37.80
CLDAN	9	5	56%	KK8	0.10	UGL	LT CRL	LT CRL	1.21
CPMS	12	0	0%	AAA8	5.69	UGL	LT CRL	LT CRL	LT CRL
CPMSO	10	5	50%	AAA8	11.5	UGL	LT CRL	LT CRL	40.63
CPMSO2	12	10	83%	AAA8	7.46	UGL	16.23	LT CRL	30.10
DBCP	12	5	42%	AY8	0.20	UGL	LT CRL	LT CRL	2.32
DCPD	10	5	50%	P8	5.00	UGL	LT CRL	LT CRL	11.50
DDVP	10	3	30%	UH11	0.50, 0.38	UGL	LT CRL	LT CRL	19.10
DIMP	9	9	100%	AW8A, AT8		UGL	45.23	27.40	86.93
DITH	12	4	33%	AAA8	1.34	UGL	LT CRL	LT CRL	13.70
DLDRN	4	4	100%	KK8		UGL	0.31	0.09	0.45
DMDS	12	0	0%	AAA8	0.55	UGL	LT CRL	LT CRL	LT CRL
DMMP	6	6	100%	AT8		UGL	6.56	1.51	17.70
ENDRN	9	9	100%	KK8		UGL	0.28	0.10	0.42
ETC6H5	11	1	9%	AV8	1.37	UGL	LT CRL	LT CRL	2.25
F	12	12	100%	HH8A, TT09		MGL	1.72	1.03	3.21
ISODR	11	7	64%	KK8	0.05	UGL	LT CRL	LT CRL	0.39
MEC6H5	11	4	36%	AV8	1.47	UGL	LT CRL	LT CRL	13.50
MIBK	11	3	27%	P8	4.90	UGL	LT CRL	LT CRL	23.90
MLTHN	10	6	60%	UH11	0.50, 0.37	UGL	LT CRL	LT CRL	3.39
OXAT	12	0	0%	AAA8	2.38	UGL	LT CRL	LT CRL	LT CRL
PPDDE	11	7	64%	KK8	0.05	UGL	LT CRL	LT CRL	0.80
PPDDT	12	6	50%	KK8	0.05	UGL	LT CRL	LT CRL	0.80
PRTHN	11	3	27%	UH11	0.65, 0.87	UGL	LT CRL	LT CRL	20.40
SO4	7	7	100%	HH8A, TT09		MGL	155.71	130.00	200.00
SUPONA	10	0	0%	UH11	0.79	UGL	LT CRL	LT CRL	LT CRL
TCLEE	10	9	90%	N8	0.75	UGL	2.42	LT CRL	3.91
TRCLE	10	2	20%	N8	0.56	UGL	LT CRL	LT CRL	1.75
XYLEN	11	5	45%	AV8	1.36	UGL	LT CRL	LT CRL	7.68

D.P.A.
08/28/90

DATA CHEM
FY 89 STATISTICAL SUMMARY
SOUTH TREATMENT PLANT

SITE: PSAAEF

ANALYTE	TOT SAMP	SAMP >CRL	% > CRL	MTH NO.	CERTIFIED REPORT LIMIT (LT)	UOM	MEAN	LOW VALUE	HIGH VALUE
111TCE	12	0	0%	N8	0.76	UGL	LT CRL	LT CRL	LT CRL
112TCE	12	0	0%	N8	0.78	UGL	LT CRL	LT CRL	LT CRL
11DCE	10	0	0%	N8	1.70	UGL	LT CRL	LT CRL	LT CRL
11DCLE	12	0	0%	N8	0.73	UGL	LT CRL	LT CRL	LT CRL
12DCE	12	0	0%	N8	0.76	UGL	LT CRL	LT CRL	LT CRL
12DCLE	12	0	0%	N8	1.10	UGL	LT CRL	LT CRL	LT CRL
13DMB	12	0	0%	AV8	1.32	UGL	LT CRL	LT CRL	LT CRL
ALDRN	12	3	25%	KK8	0.05	UGL	LT CRL	LT CRL	0.2
AS	12	12	100%	AX8		UGL	6.81	2.83	17.00
ATZ	9	0	0%	UH11	4.03	UGL	LT CRL	LT CRL	LT CRL
BCHPD	11	0	0%	P8	5.90	UGL	LT CRL	LT CRL	LT CRL
BTZ	12	1	8%	AAA8	5.00	UGL	LT CRL	LT CRL	6.3
C6H6	12	0	0%	AV8	1.05	UGL	LT CRL	LT CRL	LT CRL
CCL4	12	0	0%	N8	0.99	UGL	LT CRL	LT CRL	LT CRL
CH2CL2	8	2	25%	N8	7.40	UGL	LT CRL	LT CRL	47.0
CHCL3	12	3	25%	N8	0.50	UGL	LT CRL	LT CRL	3.7
CL	12	12	100%	HH8A, TT09		MGL	131.33	85.00	225.00
CL6CP	10	3	30%	KK8	0.05	UGL	LT CRL	LT CRL	0.1
CLC6H5	12	0	0%	N8	0.82	UGL	LT CRL	LT CRL	LT CRL
CLDAN	12	0	0%	KK8	0.10	UGL	LT CRL	LT CRL	LT CRL
CPMS	12	0	0%	AAA8	5.69	UGL	LT CRL	LT CRL	LT CRL
CPMSO	12	5	42%	AAA8	11.5	UGL	LT CRL	LT CRL	52.4
CPMSO2	12	5	42%	AAA8	7.46	UGL	LT CRL	LT CRL	65.5
DBCP	12	0	0%	AY8	0.20	UGL	LT CRL	LT CRL	LT CRL
DCPD	11	0	0%	P8	5.00	UGL	LT CRL	LT CRL	LT CRL
DDVP	9	0	0%	UH11	0.50, 0.38	UGL	LT CRL	LT CRL	LT CRL
DIMP	12	4	33%	AW8A, AT8	0.65, 0.39	UGL	LT CRL	LT CRL	8.3
DITH	12	0	0%	AAA8	1.34	UGL	LT CRL	LT CRL	LT CRL
DLDRN	11	2	18%	KK8	0.05	UGL	LT CRL	LT CRL	0.0
DMDS	12	0	0%	AAA8	0.55	UGL	LT CRL	LT CRL	LT CRL
DMMP	6	3	50%	AT8	0.19	UGL	LT CRL	LT CRL	12.90
ENDRN	11	1	9%	KK8	0.05	UGL	LT CRL	LT CRL	0.08
ETC6H5	12	0	0%	AV8	1.37	UGL	LT CRL	LT CRL	LT CRL
F	12	12	100%	HH8A, TT09		MGL	1.50	0.43	2.3
ISODR	11	0	0%	KK8	0.05	UGL	LT CRL	LT CRL	LT CRL
MEC6H5	12	0	0%	AV8	1.47	UGL	LT CRL	LT CRL	LT CRL
MIBK	11	0	0%	P8	4.90	UGL	LT CRL	LT CRL	LT CRL
MLTHN	9	2	22%	UH11	0.50, 0.37	UGL	LT CRL	LT CRL	1.0
OXAT	12	0	0%	AAA8	2.38	UGL	LT CRL	LT CRL	LT CRL
PPDDE	11	0	0%	KK8	0.05	UGL	LT CRL	LT CRL	LT CRL
PPDDT	11	2	18%	KK8	0.05	UGL	LT CRL	LT CRL	0.1
PRTHN	10	1	10%	UH11	0.65	UGL	LT CRL	LT CRL	7.87
SO4	6	6	100%	HH8A, TT09		MGL	145.00	120.00	190.00
SUPONA	9	0	0%	UH11	0.79	UGL	LT CRL	LT CRL	LT CRL
TCLEE	12	0	0%	N8	0.75	UGL	LT CRL	LT CRL	LT CRL
TRCLE	12	0	0%	N8	0.56	UGL	LT CRL	LT CRL	LT CRL
XYLEN	12	0	0%	AV8	1.36	UGL	LT CRL	LT CRL	LT CRL

D.P.A.
08/28/90

DATA CHEM
FY 89 STATISTICAL SUMMARY
SOUTH TREATMENT PLANT

SITE: PSASEF

ANALYTE	TOT SAMP	SAMP >CRL	% > CRL	MTH NO.	CERTIFIED REPORT LIMIT (LT)	UOM	MEAN	LOW VALUE	HIGH VALUE
111TCE	12	1	8%	N8	0.76	UGL	LT CRL	LT CRL	1.40
112TCE	12	0	0%	N8	0.78	UGL	LT CRL	LT CRL	LT CRL
11DCE	10	0	0%	N8	1.70	UGL	LT CRL	LT CRL	LT CRL
11DCLE	12	0	0%	N8	0.73	UGL	LT CRL	LT CRL	LT CRL
12DCE	12	0	0%	N8	0.76	UGL	LT CRL	LT CRL	LT CRL
12DCLE	12	0	0%	N8	1.10	UGL	LT CRL	LT CRL	LT CRL
13DMB	12	0	0%	AV8	1.32	UGL	LT CRL	LT CRL	LT CRL
ALDRN	11	1	9%	KK8	0.05	UGL	LT CRL	LT CRL	0.06
AS	11	11	100%	AX8		UGL	8.33	2.64	23.90
ATZ	9	0	0%	UH11	4.03	UGL	LT CRL	LT CRL	LT CRL
BCHPD	11	0	0%	P8	5.90	UGL	LT CRL	LT CRL	LT CRL
BTZ	10	0	0%	AAA8	5.00	UGL	LT CRL	LT CRL	LT CRL
C6H6	12	0	0%	AV8	1.05	UGL	LT CRL	LT CRL	LT CRL
CCL4	12	0	0%	N8	0.99	UGL	LT CRL	LT CRL	LT CRL
CH2CL2	12	0	0%	N8	7.40	UGL	LT CRL	LT CRL	LT CRL
CHCL3	12	1	8%	N8	0.50	UGL	LT CRL	LT CRL	2.41
CL	12	12	100%	HH8A, TT09		MGL	119.03	89.00	140.00
CL6CP	9	1	11%	KK8	0.05	UGL	LT CRL	LT CRL	0.07
CLC6H5	12	0	0%	N8	0.82	UGL	LT CRL	LT CRL	LT CRL
CLDAN	11	0	0%	KK8	0.10	UGL	LT CRL	LT CRL	LT CRL
CPMS	12	0	0%	AAA8	5.69	UGL	LT CRL	LT CRL	LT CRL
CPMSO	12	0	0%	AAA8	11.5	UGL	LT CRL	LT CRL	LT CRL
CPMSO2	11	1	9%	AAA8	7.46	UGL	LT CRL	LT CRL	56.80
DECP	12	0	0%	AY8	0.20	UGL	LT CRL	LT CRL	LT CRL
DCPD	11	0	0%	P8	5.00	UGL	LT CRL	LT CRL	LT CRL
DDVP	8	3	38%	UH11	0.38	UGL	LT CRL	LT CRL	48.70
DIMP	12	6	50%	AW8A, AT8	0.65, 0.39	UGL	LT CRL	LT CRL	11.10
DITH	12	0	0%	AAA8	1.34	UGL	LT CRL	LT CRL	LT CRL
DLDRN	11	3	27%	KK8	0.05	UGL	LT CRL	LT CRL	0.54
DMDS	12	1	8%	AAA8	0.55	UGL	LT CRL	LT CRL	0.99
DMMP	6	4	67%	AT8	0.19	UGL	LT CRL	LT CRL	14.90
ENDRN	11	3	27%	KK8	0.05	UGL	LT CRL	LT CRL	0.67
ETC6H5	12	0	0%	AV8	1.37	UGL	LT CRL	LT CRL	LT CRL
F	12	12	100%	HH8A, TT09		MGL	1.49	0.73	2.44
ISODR	11	0	0%	KK8	0.05	UGL	LT CRL	LT CRL	LT CRL
MEC6H5	12	0	0%	AV8	1.47	UGL	LT CRL	LT CRL	LT CRL
MIBK	11	0	0%	P8	4.90	UGL	LT CRL	LT CRL	LT CRL
MLTHN	9	1	11%	UH11	0.37	UGL	LT CRL	LT CRL	0.51
OXAT	12	0	0%	AAA8	2.38	UGL	LT CRL	LT CRL	LT CRL
PPDDE	11	2	18%	KK8	0.05	UGL	LT CRL	LT CRL	0.24
PPDDT	11	2	18%	KK8	0.05	UGL	LT CRL	LT CRL	0.16
PRTHN	10	1	10%	UH11	0.65	UGL	LT CRL	LT CRL	0.68
SO4	7	7	100%	HH8A, TT09		MGL	160.00	140.00	190.00
SUPONA	9	2	22%	UH11	0.79	UGL	LT CRL	LT CRL	1.91
TCLEE	12	0	0%	N8	0.75	UGL	LT CRL	LT CRL	LT CRL
TRCLE	12	0	0%	N8	0.56	UGL	LT CRL	LT CRL	LT CRL
XYLEN	12	0	0%	AV8	1.36	UGL	LT CRL	LT CRL	LT CRL

APPENDIX B:
Treatment Plant GC/MS Analysis

ROCKY MOUNTAIN ARSENAL
SOUTH PLANTS WASTEWATER TREATMENT SYSTEM
GC/MS ANALYTICAL DATA

LABORATORY: DATACHEM
SAMPLE DATE: 10/04/88
UNIT OF MEASURE: UGL

ANALYTE	CODE	PSIFIN	PSAAEF	PSASEF
1,1,1-TRICHLOROETHANE	111TCE	.....	LT	1.00
1,1,2-TRICHLOROETHANE	112TCE	.....	LT	1.00
1,1-DICHLOROETHYLENE	11DCE	.....	LT	1.00
1,1-DICHLOROETHANE	11DCE	.....	LT	1.00
1,2-DICHLOROETHYLENE	12DCE	.....	LT	5.00
1,2-DICHLOROETHANE	12DCE	.....	LT	1.00
1,2-DICHLOROPROPANE	12DCLP	.....	LT	1.00
1,3-DICHLOROBENZENE	13DCLB	.....	LT	1.00
1,3-DICHLOROPROPANE	13DCP	.....	LT	4.80
M-XYLENE	13DMB	.....	LT	1.00
2-CHLOROETHYL VINYL ETHER	2CLEVE	.....	LT	3.50
ACETONE	ACET	.....	LT	8.00
ACRYLONITRILE	ACRYLO	.....	LT	8.40
ALDRIN	ALDRN	.....	LT	7.50
ATRAZINE	ATZ	.....	LT	5.60
BROMODICHLOROMETHANE	BROCLM	.....	LT	1.00
CHLOROETHENE	C2H3CL	.....	LT	12.00
CHLOROETHANE	C2H5CL	.....	LT	8.00
BENZENE	C6H6	.....	LT	1.00
TRICHLOROFLUOROMETHANE	CCL3F	.....	LT	1.00
CARBON TETRACHLORIDE	CCL4	.....	LT	1.00
METHYLENE CHLORIDE	CH2CL2	.....	LT	1.00
BROMOMETHANE	CH3BR	.....	LT	14.00
CHLOROMETHANE	CH3CL	.....	LT	1.20
BROMOFORM	CHBR3	.....	LT	11.00
CHLOROFORM	CHCL3	.....	LT	1.00
HEXACHLOROCYCLOPENTADIENE (HCCPD)	CL6CP	.....	LT	21.00
CHLOROBENZENE	CLC6H5	.....	LT	1.00
CHLORDANE	CLDAN	.....	LT	9.40
P-CHLOROPHENYLMETHYL SULFIDE	CPMS	.....	LT	17.00
P-CHLOROPHENYLMETHYL SULFOXIDE	CPMSO	.....	LT	29.00
P-CHLOROPHENYLMETHYL SULFONE	CPMSO2	.....	LT	7.20
DIBROMOCHLOROPROPANE	DBCP	.....	LT	19.00
DIBROMOCHLOROMETHANE	DBRCLM	.....	LT	1.00
DICHLOROBENZENE	DCLB	.....	LT	2.00
DICYCLOPENTADIENE	DCPD	.....	LT	7.30
VAPONA	DOVP	.....	LT	17.00
DIISOPROPYLMETHYLPHOSPHONATE	DIMP	.....	LT	14.00
DITHIAME	DITHN	.....	LT	21.00
DIELDRIN	DLDRN	.....	LT	4.70
DIMETHYLMETHYLPHOSPHATE	DMMP	.....	LT	33.00
ENDRIN	ENDRN	.....	LT	8.00

ROCKY MOUNTAIN ARSENAL
SOUTH PLANTS WASTEWATER TREATMENT SYSTEM
GC/MS ANALYTICAL DATA

LABORATORY: DATACHEM
SAMPLE DATE: 10/04/88
UNIT OF MEASURE: UGL

ANALYTE	CODE	PSIFIN	PSAAEF	PSASEF
ETHYLBENZENE	ETC6H5	.....	LT	1.00
ISODRIN	ISODR	.....	LT	3.70
TOLUENE	MEC6H5	.....	LT	1.00
METHYLETHYLKETONE	MEK	.....	LT	10.00
METHYLISOBUTYLKETONE	MIBK	.....	LT	1.40
MALATHION	MLTHN	.....	LT	14.00
1,4-OXATHIANE	OXAT	.....	LT	7.90
2,2-BIS(PARA-CHLOROPHENYL)-1,1-DICHLOROETHENE	PPDE	.....	LT	6.10
2,2-BIS(PARA-CHLOROPHENYL)1,1,1-TRICHLOROETHANE	PPDT	.....	LT	9.20
PARATHION	PRTHN	.....	LT	19.00
SUPONA	SUPONA	.....	LT	9.30
1,1,2,2-TETRACHLOROETHANE	TCLEA	.....	LT	1.50
TETRACHLOROETHYLENE	TCLEE	.....	LT	1.00
TRICHLOROETHYLENE	TRCLE	.....	LT	1.00
XYLENES	XYLEN	.....	LT	2.00

..... INDICATES THAT ANALYSIS WAS NOT PERFORMED

ROCKY MOUNTAIN ARSENAL
SOUTH PLANTS WASTEWATER TREATMENT SYSTEM
GC/MS ANALYTICAL DATA

LABORATORY: DATACHEN
SAMPLE DATE: 12/01/88
UNIT OF MEASURE: UGL

ANALYTE	CODE	PSIFIN	PSAAEF	PSASEF
1,1,1-TRICHLOROETHANE	111TCE	2.25	LT	1.00
1,1,2-TRICHLOROETHANE	112TCE	LT	1.00	LT
1,1-DICHLOROETHYLENE	110CE	LT	1.00	LT
1,1-DICHLOROETHANE	110CLE	LT	1.00	LT
1,2-DICHLOROETHYLENE	120CE	LT	5.00	LT
1,2-DICHLOROETHANE	120CLE	LT	1.00	LT
1,2-DICHLOROPROPANE	120CLP	LT	1.00	LT
1,3-DICHLOROBENZENE	130CLB	LT	1.00	LT
1,3-DICHLOROPROPANE	130CP	LT	4.80	LT
M-XYLENE	130MB	LT	1.00	LT
2,3,6-TRICHLOROPHENOL	236TCP	LT	1.70	LT
2,4,5-TRICHLOROPHENOL	245TCP	LT	2.80	LT
2,4,6-TRICHLOROPHENOL	246TCP	LT	3.60	LT
2,4-DICHLOROPHENOL	240CLP	LT	8.40	LT
2,4-DIMETHYLPHENOL	240MPH	LT	4.40	LT
2,4-DINITROPHENOL	240NP	LT	176.00	LT
2-CHLOROETHYL VINYL ETHER	2CLEVE	LT	3.50	LT
2-CHLOROPHENOL	2CLP	LT	2.80	LT
2-METHYLPHENOL	2MP	LT	3.60	LT
2-NITROPHENOL	2NP	LT	8.20	LT
3-METHYL-4-CHLOROPHENOL	4CL3C	LT	8.50	LT
4-METHYLPHENOL	4MP	LT	2.80	LT
4-NITROPHENOL	4NP	LT	96.00	LT
ACETONE	ACET	LT	8.00	LT
ACRYLONITRILE	ACRYLO	LT	8.40	LT
ALDRIN	ALDRN	LT	13.00	LT
ATRAZINE	ATZ	LT	5.90	LT
BROMODICHLOROMETHANE	BRDCLM	LT	1.00	LT
CHLOROETHENE	C2H3CL	LT	12.00	LT
CHLOROETHANE	C2H5CL	LT	8.00	LT
BENZENE	C6H6	LT	1.00	LT
TRICHLOROFLUOROMETHANE	CCL3F	LT	1.00	LT
CARBON TETRACHLORIDE	CCL4	LT	1.00	LT
METHYLENE CHLORIDE	CH2CL2		94.90	LT
BROMOMETHANE	CH3BR	LT	14.00	LT
CHLOROMETHANE	CH3CL	LT	1.20	LT
BROMOFORM	CHBR3	LT	11.00	LT
CHLOROFORM	CHCL3		110.00	LT
HEXACHLOROCYCLOPENTADIENE (HCCPD)	CL6CP	LT	54.00	LT
CHLOROBENZENE	CLC6H5	LT	1.00	LT
CHLORDANE	CLDAN	LT	37.00	LT
P-CHLOROPHENYLMETHYL SULFIDE	CPMS	LT	10.00	LT

ROCKY MOUNTAIN ARSENAL
SOUTH PLANTS WASTEWATER TREATMENT SYSTEM
GC/MS ANALYTICAL DATA

LABORATORY: DATACHEM
SAMPLE DATE: 12/01/88
UNIT OF MEASURE: UGL

ANALYTE	CODE	PSIFIN	PSAAEF	PSASEF
P-CHLOROPHENYLMETHYL SULFOXIDE	CPMSO	LT 15.00	LT 15.00	LT 15.00
P-CHLOROPHENYLMETHYL SULFONE	CPMSO2	21.40	LT 5.30	LT 5.30
DIBROMOCHLOROPROPANE	DBCP	LT 12.00	LT 12.00	LT 12.00
DIBROMOCHLOROMETHANE	DBRCLM	LT 1.00	LT 1.00	LT 1.00
DICHLOROBENZENE	DCLB	LT 2.00	LT 2.00	LT 2.00
DICYCLOPENTADIENE	DCPD	LT 5.50	LT 5.50	LT 5.50
VAPONA	DOVP	LT 8.50	LT 8.50	LT 8.50
DIISOPROPYLMETHYLPHOSPHONATE	DIMP	44.30	LT 21.00	LT 21.00
DITHIANE	DITH	LT 3.30	LT 3.30	LT 3.30
DIELDRIN	DLDRN	LT 26.00	LT 26.00	LT 26.00
DIMETHYLMETHYLPHOSPHATE	DMMP	LT 130.00	LT 130.00	LT 130.00
ENDRIN	ENDRN	LT 18.00	LT 18.00	LT 18.00
ETHYLBENZENE	ETC6H5	LT 1.00	LT 1.00	LT 1.00
ISODRIN	ISODR	LT 7.80	LT 7.80	LT 7.80
TOLUENE	MEC6H5	LT 1.00	LT 1.00	LT 1.00
METHYLETHYLKETONE	MEK	LT 10.00	LT 10.00	LT 10.00
METHYLISOBUTYLKETONE	MIBK	LT 1.40	LT 1.40	LT 1.40
MALATHION	MLTHN	LT 21.00	LT 21.00	LT 21.00
1,4-OXATHIANE	OXAT	LT 27.00	LT 27.00	LT 27.00
PENTACHLOROPHENOL	PCP	LT 9.10	LT 9.10	LT 9.10
PHENOL	PHENOL	LT 2.20	LT 2.20	LT 2.20
2,2-BIS(PARA-CHLOROPHENYL)-1,1-DICHLOROETHENE	PPDDE	LT 14.00	LT 14.00	LT 14.00
2,2-BIS(PARA-CHLOROPHENYL)1,1,1-TRICHLOROETHANE	PPDDT	LT 18.00	LT 18.00	LT 18.00
PARATHION	PRTHN	LT 37.00	LT 37.00	LT 37.00
SUPONA	SUPONA	LT 19.00	LT 19.00	LT 19.00
1,1,2,2-TETRACHLOROETHANE	TCLEA	LT 1.50	LT 1.50	LT 1.50
TETRACHLOROETHYLENE	TCLEE	4.54	LT 1.00	LT 1.00
TRICHLOROETHYLENE	TRCLE	LT 1.00	LT 1.00	LT 1.00
XYLENES	XYLEN	LT 2.00	LT 2.00	LT 2.00

..... INDICATES THAT ANALYSIS WAS NOT PERFORMED

ROCKY MOUNTAIN ARSENAL
SOUTH PLANTS WASTEWATER TREATMENT SYSTEM
GC/MS ANALYTICAL DATA

LABORATORY: DATACHEM
SAMPLE DATE: 12/29/88
UNIT OF MEASURE: UGL

ANALYTE	CODE	PSIFIN	PSAAEF	PSASEF
2,3,6-TRICHLOROPHENOL	236TCP	LT 1.70	LT 1.70	LT 1.70
2,4,5-TRICHLOROPHENOL	245TCP	LT 2.80	LT 2.80	LT 2.80
2,4,6-TRICHLOROPHENOL	246TCP	LT 3.60	LT 3.60	LT 3.60
2,4-DICHLOROPHENOL	240CLP	LT 8.40	LT 8.40	LT 8.40
2,4-DIMETHYLPHENOL	240MPH	LT 4.40	LT 4.40	LT 4.40
2,4-DINITROPHENOL	240NP	LT 176.00	LT 176.00	LT 176.00
2-CHLOROPHENOL	2CLP	LT 2.80	LT 2.80	LT 2.80
2-METHYLPHENOL	2MP	LT 3.60	LT 3.60	LT 3.60
2-NITROPHENOL	2NP	LT 8.20	LT 8.20	LT 8.20
3-METHYL-4-CHLOROPHENOL	4CL3C	LT 8.50	LT 8.50	LT 8.50
4-METHYLPHENOL	4MP	LT 2.80	LT 2.80	LT 2.80
4-NITROPHENOL	4NP	LT 96.00	LT 96.00	LT 96.00
ALDRIN	ALDRN	LT 13.00	LT 13.00	LT 13.00
ATRAZINE	ATZ	LT 5.90	LT 5.90	LT 5.90
HEXACHLOROCYCLOPENTADIENE (HCCPD)	CL6CP	LT 54.00	LT 54.00	LT 54.00
CHLORDANE	CLDAN	LT 37.00	LT 37.00	LT 37.00
P-CHLOROPHENYLMETHYL SULFIDE	CPMS	LT 10.00	LT 10.00	LT 10.00
P-CHLOROPHENYLMETHYL SULFOXIDE	CPMSO	LT 15.00	LT 15.00	LT 15.00
P-CHLOROPHENYLMETHYL SULFONE	CPMSO2	.....	LT 5.30	LT 5.30
DIBROMOCHLOROPROPANE	DBCP	LT 12.00	LT 12.00	LT 12.00
DICYCLOPENTADIENE	DCPD	LT 5.50	LT 5.50	LT 5.50
VAPONA	DDVP	LT 8.50	LT 8.50	LT 8.50
DIISOPROPYLMETHYLPHOSPHONATE	DIMP	.....	LT 21.00	LT 21.00
DITHIANE	DITH	LT 3.30	LT 3.30	LT 3.30
DIELDRIN	DLDRN	LT 26.00	LT 26.00	LT 26.00
DIMETHYLMETHYLPHOSPHATE	DMMP	LT 130.00	LT 130.00	LT 130.00
ENDRIN	ENDRN	LT 18.00	LT 18.00	LT 18.00
ISODRIN	ISODR	LT 7.80	LT 7.80	LT 7.80
MALATHION	MLTHN	LT 21.00	LT 21.00	LT 21.00
1,4-OXATHIANE	OXAT	LT 27.00	LT 27.00	LT 27.00
PENTACHLOROPHENOL	PCP	LT 9.10	LT 9.10	LT 9.10
PHENOL	PHENOL	LT 2.20	LT 2.20	LT 2.20
2,2-BIS(PARA-CHLOROPHENYL)-1,1-DICHLOROETHENE	PPDDE	LT 14.00	LT 14.00	LT 14.00
2,2-BIS(PARA-CHLOROPHENYL)1,1,1-TRICHLOROETHANE	PPDDT	LT 18.00	LT 18.00	LT 18.00
PARATHION	PRTHN	LT 37.00	LT 37.00	LT 37.00
SUPONA	SUPONA	LT 19.00	LT 19.00	LT 19.00

..... INDICATES THAT ANALYSIS WAS NOT PERFORMED

ROCKY MOUNTAIN ARSENAL
SOUTH PLANTS WASTEWATER TREATMENT SYSTEM
GC/MS ANALYTICAL DATA

LABORATORY: DATACHEM
SAMPLE DATE: 01/25/89
UNIT OF MEASURE: UGL

ANALYTE	CODE	PSIFIN	PSAAEF	PSASEF
1,1,1-TRICHLOROETHANE	111TCE	LT 100.00	LT 1.00	LT 1.00
1,1,2-TRICHLOROETHANE	112TCE	LT 100.00	LT 1.00	LT 1.00
1,1-DICHLOROETHYLENE	110CE	LT 100.00	LT 1.00	LT 1.00
1,1-DICHLOROETHANE	110CLE	LT 100.00	LT 1.00	LT 1.00
1,2-DICHLOROETHYLENE	120CE	LT 500.00	LT 5.00	LT 5.00
1,2-DICHLOROETHANE	120CLE	LT 100.00	LT 1.00	LT 1.00
1,2-DICHLOROPROPANE	120CLP	LT 100.00	LT 1.00	LT 1.00
1,3-DICHLOROBENZENE	130CLB	LT 100.00	LT 1.00	LT 1.00
1,3-DICHLOROPROPANE	130CP	LT 480.00	LT 4.80	LT 4.80
M-XYLENE	130M8	LT 100.00	LT 1.00	LT 1.00
2-CHLOROETHYLVINYL ETHER	2CLEVE	LT 350.00	LT 3.50	LT 3.50
ACETONE	ACET	3,700.00	LT 217.00	LT 8.00
ACRYLONITRILE	ACRYLO	LT 840.00	LT 8.40	LT 8.40
BROMODICHLOROMETHANE	BRDCLM	LT 100.00	LT 1.00	LT 1.00
CHLOROETHENE	C2H3CL	LT 1,200.00	LT 12.00	LT 12.00
CHLOROETHANE	C2H5CL	LT 800.00	LT 8.00	LT 8.00
BENZENE	C6H6	LT 100.00	LT 1.00	LT 1.00
TRICHLOROFLUOROMETHANE	CCL3F	LT 100.00	LT 1.00	LT 1.00
CARBON TETRACHLORIDE	CCL4	LT 100.00	LT 1.00	LT 1.00
METHYLENE CHLORIDE	CH2CL2	6,670.00	2.53	2.22
BROMOMETHANE	CH3BR	LT 1,400.00	LT 14.00	LT 14.00
CHLOROMETHANE	CH3CL	LT 120.00	LT 1.20	LT 1.20
BROMOFORM	CHBR3	LT 1,100.00	LT 11.00	LT 11.00
CHLOROFORM	CHCL3	570.00	LT 1.00	LT 1.00
CHLOROBENZENE	CLC6H5	LT 100.00	LT 1.00	LT 1.00
DIBROMOCHLOROMETHANE	DBRCLM	LT 100.00	LT 1.00	LT 1.00
DICHLOROBENZENE	DCLB	LT 200.00	LT 2.00	LT 2.00
ETHYLBENZENE	ETC6H5	LT 100.00	LT 1.00	LT 1.00
TOLUENE	MEC6H5	LT 100.00	LT 1.00	LT 1.00
METHYLETHYLKETONE	MEK	LT 1,000.00	LT 10.00	LT 10.00
METHYLISOBUTYLKETONE	MIBK	LT 140.00	LT 1.40	LT 1.40
1,1,2,2-TETRACHLOROETHANE	TCLEA	LT 150.00	LT 1.50	LT 1.50
TETRACHLOROETHYLENE	TCLEE	LT 100.00	LT 1.00	LT 1.00
TRICHLOROETHYLENE	TRCLE	LT 100.00	LT 1.00	LT 1.00
XYLENES	XYLEN	LT 200.00	LT 2.00	LT 2.00

..... INDICATES THAT ANALYSIS WAS NOT PERFORMED

ROCKY MOUNTAIN ARSENAL
SOUTH PLANTS WASTEWATER TREATMENT SYSTEM
GC/MS ANALYTICAL DATA

LABORATORY: DATACHEM
SAMPLE DATE: 02/22/89
UNIT OF MEASURE: UGL

ANALYTE	CODE	PSIFIN	PSAAEF	PSASEF
1,1,1-TRICHLOROETHANE	111TCE	LT 250.00	LT 25.00	LT 1.00
1,1,2-TRICHLOROETHANE	112TCE	LT 250.00	LT 25.00	LT 1.00
1,1-DICHLOROETHYLENE	11DCE	LT 250.00	LT 25.00	LT 1.00
1,1-DICHLOROETHANE	11DCLE	LT 250.00	LT 25.00	LT 1.00
1,2-DICHLOROETHYLENE	12DCE	LT 1,250.00	LT 125.00	LT 5.00
1,2-DICHLOROETHANE	12DCLE	LT 250.00	LT 25.00	LT 1.00
1,2-DICHLOROPROPANE	12DCLP	LT 250.00	LT 25.00	LT 1.00
1,3-DICHLOROBENZENE	13DCLB	LT 250.00	LT 25.00	LT 1.00
1,3-DICHLOROPROPANE	13DCP	LT 1,200.00	LT 120.00	LT 4.80
M-XYLENE	13DMB	LT 250.00	LT 25.00	LT 1.00
2,3,6-TRICHLOROPHENOL	236TCP	LT 1.70	LT 1.70	LT 1.70
2,4,5-TRICHLOROPHENOL	245TCP	LT 2.80	LT 2.80	LT 2.80
2,4,6-TRICHLOROPHENOL	246TCP	LT 3.60	LT 3.60	LT 3.60
2,4-DICHLOROPHENOL	24DCLP	LT 8.40	LT 8.40	LT 8.40
2,4-DIMETHYLPHENOL	24DMPM	5.57	LT 4.40	LT 4.40
2,4-DINITROPHENOL	24DNP	LT 176.00	LT 176.00	LT 176.00
2-CHLOROETHYL VINYL ETHER	2CLEVE	LT 875.00	LT 426.00	LT 3.50
2-CHLOROPHENOL	2CLP	LT 2.80	LT 2.80	LT 2.80
2-METHYLPHENOL	2MP	LT 3.60	LT 3.60	LT 3.60
2-NITROPHENOL	2NP	LT 8.20	LT 8.20	LT 8.20
3-METHYL-4-CHLOROPHENOL	4CL3C	LT 8.50	LT 8.50	LT 8.50
4-METHYLPHENOL	4MP	17.10	LT 2.80	LT 2.80
4-NITROPHENOL	4NP	LT 96.00	LT 96.00	LT 96.00
ACETONE	ACET	LT 2,000.00	LT 525.00	LT 8.00
ACRYLONITRILE	ACRYLO	LT 2,100.00	LT 210.00	LT 8.40
ALDRIN	ALDRN	LT 13.00	LT 13.00	LT 13.00
ATRAZINE	ATZ	LT 5.90	LT 5.90	LT 5.90
BROMODICHLOROMETHANE	BRDCLM	LT 250.00	LT 25.00	LT 1.00
CHLOROETHENE	C2K3CL	LT 3,000.00	LT 300.00	LT 12.00
CHLOROETHANE	C2N5CL	LT 2,000.00	LT 200.00	LT 8.00
BENZENE	C6H6	14,900.00	25.00	0.93
TRICHLOROFLUOROMETHANE	CCL3F	LT 250.00	LT 25.00	LT 1.00
CARBON TETRACHLORIDE	CCL4	LT 250.00	LT 25.00	LT 1.00
METHYLENE CHLORIDE	CH2CL2	859.00	LT 2,370.00	LT 1.00
BROMOMETHANE	CH3BR	LT 3,500.00	LT 350.00	LT 14.00
CHLOROMETHANE	CH3CL	LT 300.00	LT 30.00	LT 1.20
BROMOFORM	CHBr3	LT 2,750.00	LT 275.00	LT 11.00
CHLOROFORM	CHCL3	325.00	LT 25.00	LT 1.00
HEXACHLOROCYCLOPENTADIENE (HCCPD)	CL6CP	LT 54.00	LT 54.00	LT 54.00
CHLOROBENZENE	CLC6H5	LT 250.00	LT 25.00	LT 1.00
CHLORDANE	CLDAN	LT 37.00	LT 37.00	LT 37.00
P-CHLOROPHENYLMETHYL SULFIDE	CPMS	LT 10.00	LT 10.00	LT 10.00

ROCKY MOUNTAIN ARSENAL
SOUTH PLANTS WASTEWATER TREATMENT SYSTEM
GC/MS ANALYTICAL DATA

LABORATORY: DATACHEM
SAMPLE DATE: 02/22/89
UNIT OF MEASURE: UGL

ANALYTE	CODE	PSIFIN	PSAAEF	PSASEF
P-CHLOROPHENYLMETHYL SULFOXIDE	CPMSO	LT 15.00	LT 15.00	LT 15.00
P-CHLOROPHENYLMETHYL SULFONE	CPMSO2	15.10	LT 5.30	LT 5.30
DIBROMOCHLOROPROPANE	DBCP	LT 12.00	LT 12.00	LT 12.00
DIBROMOCHLOROMETHANE	DBRCLM	LT 250.00	LT 25.00	LT 1.00
DICHLOROBENZENE	DCLB	LT 500.00	LT 50.00	LT 2.00
DICYCLOPENTADIENE	DCPD	11.50	LT 5.50	LT 5.50
VAPONA	DOVP	LT 8.50	LT 8.50	LT 8.50
DIISOPROPYLMETHYLPHOSPHONATE	DIMP	LT 21.00	LT 21.00	LT 21.00
DITHIANE	DITH	LT 3.30	LT 3.30	LT 3.30
DIELDRIN	DLDRM	LT 26.00	LT 26.00	LT 26.00
DIMETHYLMETHYLPHOSPHATE	DMMP	LT 130.00	LT 130.00	LT 130.00
ENDRIN	ENDRM	LT 18.00	LT 18.00	LT 18.00
ETHYLBENZENE	ETC6H5	LT 250.00	LT 25.00	LT 1.00
ISODRIN	ISODR	LT 7.80	LT 7.80	LT 7.80
TOLUENE	MEC6H5	LT 250.00	LT 25.00	LT 1.00
METHYLETHYLKETONE	MEK	LT 2,500.00	LT 250.00	LT 10.00
METHYLISOBUTYLKETONE	MIBK	LT 350.00	LT 35.00	LT 1.40
MALATHION	MLTHN	LT 21.00	LT 21.00	LT 21.00
1,4-OXATHIANE	OXAT	LT 27.00	LT 27.00	LT 27.00
PENTACHLOROPHENOL	PCP	LT 9.10	LT 9.10	LT 9.10
PHENOL	PHENOL	GT 300.00	LT 2.20	LT 2.20
2,2-BIS(PARA-CHLOROPHENYL)-1,1-DICHLOROETHENE	PPDE	LT 14.00	LT 14.00	LT 14.00
2,2-BIS(PARA-CHLOROPHENYL)1,1,1-TRICHLOROETHANE	PPDT	LT 18.00	LT 18.00	LT 18.00
PARATHION	PRTHN	LT 37.00	LT 37.00	LT 37.00
SUPONA	SUPONA	LT 19.00	LT 19.00	LT 19.00
1,1,2,2-TETRACHLOROETHANE	TCLEA	LT 375.00	LT 37.50	LT 1.50
TETRACHLOROETHYLENE	TCLEE	LT 250.00	LT 25.00	LT 1.00
TRICHLOROETHYLENE	TRCLE	LT 250.00	LT 25.00	LT 1.00
XYLENES	XYLEN	LT 500.00	LT 50.00	LT 2.00

..... INDICATES THAT ANALYSIS WAS NOT PERFORMED

ROCKY MOUNTAIN ARSENAL
SOUTH PLANTS WASTEWATER TREATMENT SYSTEM
GC/MS ANALYTICAL DATA

LABORATORY: DATACHEN
SAMPLE DATE: 03/29/89
UNIT OF MEASURE: UGL

ANALYTE	CODE	PSIFIN	PSAAEF	PSASEF
1,1,1-TRICHLOROETHANE	111TCE	LT 1.00	LT 10.00	LT 1.00
1,1,2-TRICHLOROETHANE	112TCE	LT 1.00	LT 10.00	LT 1.00
1,1-DICHLOROETHYLENE	11DCE	LT 1.00	LT 10.00	LT 1.00
1,1-DICHLOROETHANE	11DCLE	LT 1.00	LT 10.00	LT 1.00
1,2-DICHLOROETHYLENE	12DCE	LT 5.00	LT 50.00	LT 5.00
1,2-DICHLOROETHANE	12DCLE	LT 1.00	LT 10.00	LT 1.00
1,2-DICHLOROPROPANE	12DCLP	LT 1.00	LT 10.00	LT 1.00
1,3-DICHLOROBENZENE	13DCLB	LT 1.00	LT 10.00	LT 1.00
1,3-DICHLOROPROPANE	13DCP	LT 4.80	LT 48.00	LT 4.80
M-XYLENE	13DM8	LT 1.00	LT 10.00	LT 1.00
2-CHLOROETHYL VINYL ETHER	2CLEVE	LT 3.50	LT 35.00	LT 3.50
ACETONE	ACET	LT 8.00	LT 1,190.00	LT 8.00
ACRYLONITRILE	ACRYLO	LT 8.40	LT 84.00	LT 8.40
BROMODICHLOROMETHANE	BRDCLM	LT 1.00	LT 10.00	LT 1.00
CHLOROETHENE	C2H3CL	LT 12.00	LT 120.00	LT 12.00
CHLOROETHANE	C2H5CL	LT 8.00	LT 80.00	LT 8.00
BENZENE	C6H6	LT 1.00	LT 10.00	LT 1.00
TRICHLOROFLUOROMETHANE	CCL3F	LT 1.00	LT 10.00	LT 1.00
CARBON TETRACHLORIDE	CCL4	LT 1.00	LT 10.00	LT 1.00
METHYLENE CHLORIDE	CH2CL2	LT 1.00	LT 1,010.00	LT 1.00
BROMOMETHANE	CH3BR	LT 14.00	LT 140.00	LT 14.00
CHLOROMETHANE	CH3CL	LT 1.20	LT 12.00	LT 1.20
BROMOFORM	CHBR3	LT 11.00	LT 110.00	LT 11.00
CHLOROFORM	CHCL3	LT 6.80	LT 10.00	LT 1.00
CHLOROBENZENE	CLC6H5	LT 1.00	LT 10.00	LT 1.00
DIBROMOCHLOROMETHANE	DBRCLM	LT 1.00	LT 10.00	LT 1.00
DICHLOROBENZENE	DCLB	LT 2.00	LT 20.00	LT 2.00
ETHYLBENZENE	ETC6H5	LT 1.00	LT 10.00	LT 1.00
TOLUENE	MEC6H5	LT 1.00	LT 10.00	LT 1.00
METHYLETHYLKETONE	MEK	LT 10.00	LT 100.00	LT 10.00
METHYLISOBUTYLKETONE	MIBK	LT 1.40	LT 14.00	LT 1.40
1,1,2,2-TETRACHLOROETHANE	TCLEA	LT 1.50	LT 15.00	LT 1.50
TETRACHLOROETHYLENE	TCLEE	LT 1.00	LT 10.00	LT 1.00
TRICHLOROETHYLENE	TRCLE	LT 1.00	LT 10.00	LT 1.00
XYLENES	XYLEM	LT 2.00	LT 20.00	LT 2.00

..... INDICATES THAT ANALYSIS WAS NOT PERFORMED

ROCKY MOUNTAIN ARSENAL
SOUTH PLANTS WASTEWATER TREATMENT SYSTEM
GC/MS ANALYTICAL DATA

LABORATORY: DATACHEN
SAMPLE DATE: 04/26/89
UNIT OF MEASURE: UGL

ANALYTE	CODE	PSIFIN	PSAAEF	PSASEF
1,1,1-TRICHLOROETHANE	111TCE	LT 20.00	LT 50.00	LT 1.00
1,1,2-TRICHLOROETHANE	112TCE	LT 20.00	LT 50.00	LT 1.00
1,1-DICHLOROETHYLENE	11DCE	LT 20.00	LT 50.00	LT 1.00
1,1-DICHLOROETHANE	11DCLE	LT 20.00	LT 50.00	LT 1.00
1,2-DICHLOROETHYLENE	12DCE	LT 100.00	LT 250.00	LT 5.00
1,2-DICHLOROETHANE	12DCLE	LT 20.00	LT 50.00	LT 1.00
1,2-DICHLOROPROPANE	12DCLP	LT 20.00	LT 50.00	LT 1.00
1,3-DICHLOROBENZENE	13DCLB	LT 20.00	LT 50.00	LT 1.00
1,3-DICHLOROPROPANE	13DCP	LT 96.00	LT 240.00	LT 4.80
M-XYLENE	13DMB	LT 20.00	LT 50.00	LT 1.00
2,3,6-TRICHLOROPHENOL	236TCP	LT 1.70	LT 1.70	LT 1.70
2,4,5-TRICHLOROPHENOL	245TCP	LT 2.80	LT 2.80	LT 2.80
2,4,6-TRICHLOROPHENOL	246TCP	LT 3.60	LT 3.60	LT 3.60
2,4-DICHLOROPHENOL	24DCLP	LT 8.40	LT 8.40	LT 8.40
2,4-DIMETHYLPHENOL	24DMPN	LT 4.40	LT 4.40	LT 4.40
2,4-DINITROPHENOL	24DNP	LT 176.00	LT 176.00	LT 176.00
2-CHLOROETHYL VINYL ETHER	2CLEVE	LT 70.00	LT 175.00	LT 3.50
2-CHLOROPHENOL	2CLP	LT 2.80	LT 2.80	LT 2.80
2-METHYLPHENOL	2MP	LT 3.60	LT 3.60	LT 3.60
2-NITROPHENOL	2NP	LT 8.20	LT 8.20	LT 8.20
3-METHYL-4-CHLOROPHENOL	4CL3C	LT 8.50	LT 8.50	LT 8.50
4-METHYLPHENOL	4MP	LT 5.01	LT 2.80	LT 2.80
4-NITROPHENOL	4NP	LT 96.00	LT 96.00	LT 96.00
ACETONE	ACET	3,360.00	LT 3,700.00	LT 8.00
ACRYLONITRILE	ACRYLO	LT 168.00	LT 420.00	LT 8.40
ALDRIN	ALDRN	LT 13.00	LT 13.00	LT 13.00
ATRAZINE	ATZ	LT 5.90	LT 5.90	LT 5.90
BROMODICHLOROMETHANE	BRDCLM	LT 20.00	LT 50.00	LT 1.00
CHLOROETHENE	C2H3CL	LT 240.00	LT 600.00	LT 12.00
CHLOROETHANE	C2H5CL	LT 160.00	LT 400.00	LT 8.00
BENZENE	C6H6	760.00	LT 50.00	LT 1.00
TRICHLOROFLUOROMETHANE	CCL3F	LT 20.00	LT 50.00	LT 1.00
CARBON TETRACHLORIDE	CCL4	LT 20.00	LT 50.00	LT 1.00
METHYLENE CHLORIDE	CH2CL2	869.00	LT 1,360.00	LT 1.00
BROMOMETHANE	CH3BR	LT 280.00	LT 700.00	LT 14.00
CHLOROMETHANE	CH3CL	LT 24.00	LT 60.00	LT 1.20
BROMOFORM	CHBR3	LT 220.00	LT 550.00	LT 11.00
CHLOROFORM	CHCL3	178.00	LT 50.00	LT 1.00
HEXACHLOROCYCLOPENTADIENE (HCCPD)	CL6CP	LT 54.00	LT 54.00	LT 54.00
CHLOROBENZENE	CLC6H5	LT 20.00	LT 50.00	LT 1.00
CHLORDANE	CLDAN	LT 37.00	LT 37.00	LT 37.00
P-CHLOROPHENYLMETHYL SULFIDE	CPMS	LT 10.00	LT 10.00	LT 10.00

ROCKY MOUNTAIN ARSENAL
SOUTH PLANTS WASTEWATER TREATMENT SYSTEM
GC/MS ANALYTICAL DATA

LABORATORY: DATACHEM
SAMPLE DATE: 04/26/89
UNIT OF MEASURE: UGL

ANALYTE	CODE	PSIFIN	PSAAEF	PSASEF
P-CHLOROPHENYLMETHYL SULFOXIDE	CPMSO	LT 15.00	LT 15.00	LT 15.00
P-CHLOROPHENYLMETHYL SULFONE	CPMSO2	LT 5.30	LT 5.30	LT 5.30
DIBROMOCHLOROPROPANE	DBCP	LT 12.00	LT 12.00	LT 12.00
DIBROMOCHLOROMETHANE	DBRCLM	LT 20.00	LT 50.00	LT 1.00
DICHLOROBENZENE	DCLB	LT 40.00	LT 100.00	LT 2.00
DICYCLOPENTADIENE	DCPD	LT 5.50	LT 5.50	LT 5.50
VAPONA	DDVP	LT 8.50	LT 8.50	LT 8.50
DIISOPROPYLMETHYLPHOSPHONATE	DIMP	36.80	LT 21.00	LT 21.00
DITHIANE	DITH	LT 3.30	LT 3.30	LT 3.30
DIELDRIN	DLDRN	LT 26.00	LT 26.00	LT 26.00
DIMETHYLMETHYLPHOSPHATE	DMMP	LT 130.00	LT 130.00	LT 130.00
ENDRIN	ENDRN	LT 18.00	LT 18.00	LT 18.00
ETHYLBENZENE	ETC6H5	LT 20.00	LT 50.00	LT 1.00
ISODRIN	ISODR	LT 7.80	LT 7.80	LT 7.80
TOLUENE	MEC6H5	LT 20.00	LT 50.00	LT 1.00
METHYLETHYLKETONE	MEK	LT 200.00	LT 500.00	LT 10.00
METHYLISOBUTYLKETONE	MIBK	LT 28.00	LT 70.00	LT 1.40
MALATHION	MLTHN	LT 21.00	LT 21.00	LT 21.00
1,4-OXATHIANE	OXAT	LT 27.00	LT 27.00	LT 27.00
PENTACHLOROPHENOL	PCP	LT 9.10	LT 9.10	LT 9.10
PHENOL	PHENOL	77.30	LT 2.20	LT 2.20
2,2-BIS(PARA-CHLOROPHENYL)-1,1-DICHLOROETHENE	PPDDE	LT 14.00	LT 14.00	LT 14.00
2,2-BIS(PARA-CHLOROPHENYL)1,1,1-TRICHLOROETHANE	PPDDT	LT 18.00	LT 18.00	LT 18.00
PARATHION	PRTHN	LT 37.00	LT 37.00	LT 37.00
SUPONA	SUPONA	LT 19.00	LT 19.00	LT 19.00
1,1,2,2-TETRACHLOROETHANE	TCLEA	LT 30.00	LT 75.00	LT 1.50
TETRACHLOROETHYLENE	TCLEE	LT 20.00	LT 50.00	LT 1.00
TRICHLOROETHYLENE	TRCLE	LT 20.00	LT 50.00	LT 1.00
XYLENES	XYLEN	LT 40.00	LT 100.00	LT 2.00

..... INDICATES THAT ANALYSIS WAS NOT PERFORMED

ROCKY MOUNTAIN ARSENAL
SOUTH PLANTS WASTEWATER TREATMENT SYSTEM
GC/MS ANALYTICAL DATA

LABORATORY: DATACHEM
SAMPLE DATE: 05/31/89
UNIT OF MEASURE: UGL

ANALYTE	CODE	PSIFIN	PSAAEF	PSASEF
1,1,1-TRICHLOROETHANE	111TCE	LT 20.00	LT 20.00	LT 1.00
1,1,2-TRICHLOROETHANE	112TCE	LT 20.00	LT 20.00	LT 1.00
1,1-DICHLOROETHYLENE	11DCE	LT 20.00	LT 20.00	LT 1.00
1,1-DICHLOROETHANE	11DCLE	LT 20.00	LT 20.00	LT 1.00
1,2-DICHLOROETHYLENE	12DCE	LT 100.00	LT 100.00	LT 5.00
1,2-DICHLOROETHANE	12DCLE	LT 20.00	LT 20.00	LT 1.00
1,2-DICHLOROPROPANE	12DCLP	LT 20.00	LT 20.00	LT 1.00
1,3-DICHLOROBENZENE	13DCLB	LT 20.00	LT 20.00	LT 1.00
1,3-DICHLOROPROPANE	13DCP	LT 96.00	LT 96.00	LT 4.80
M-XYLENE	13DMB	LT 20.00	LT 20.00	LT 1.00
2,3,6-TRICHLOROPHENOL	236TCP	LT 1.70	LT 1.70	LT 1.70
2,4,5-TRICHLOROPHENOL	245TCP	LT 2.80	LT 2.80	LT 2.80
2,4,6-TRICHLOROPHENOL	246TCP	LT 3.60	LT 3.60	LT 3.60
2,4-DICHLOROPHENOL	24DCLP	LT 8.40	LT 8.40	LT 8.40
2,4-DIMETHYLPHENOL	24DMPN	LT 4.40	LT 4.40	LT 4.40
2,4-DINITROPHENOL	24DNP	LT 176.00	LT 176.00	LT 176.00
2-CHLOROETHYL VINYL ETHER	2CLEVE	LT 70.00	LT 70.00	LT 3.50
2-CHLOROPHENOL	2CLP	LT 2.80	LT 2.80	LT 2.80
2-METHYLPHENOL	2MP	LT 3.60	LT 3.60	LT 3.60
2-NITROPHENOL	2NP	LT 8.20	LT 8.20	LT 8.20
3-METHYL-4-CHLOROPHENOL	4CL3C	LT 8.50	LT 8.50	LT 8.50
4-METHYLPHENOL	4MP	LT 2.80	LT 2.80	LT 2.80
4-NITROPHENOL	4NP	LT 96.00	LT 96.00	LT 96.00
ACETONE	ACET	1,680.00	1,430.00	LT 8.00
ACRYLONITRILE	ACRYLO	LT 168.00	LT 168.00	LT 8.40
ALDRIN	ALDRN	LT 13.00	LT 13.00	LT 13.00
ATRAZINE	ATZ	LT 5.90	LT 5.90	LT 5.90
BROMODICHLOROMETHANE	BRDCLM	LT 20.00	LT 20.00	LT 1.00
CHLOROETHENE	C2H3CL	LT 240.00	LT 240.00	LT 12.00
CHLOROETHANE	C2H5CL	LT 160.00	LT 160.00	LT 8.00
BENZENE	C6H6	202.00	LT 20.00	LT 1.00
TRICHLOROFLUOROMETHANE	CCL3F	LT 20.00	LT 20.00	LT 1.00
CARBON TETRACHLORIDE	CCL4	LT 20.00	LT 1.00	LT 1.00
METHYLENE CHLORIDE	CH2CL2	646.00	283.00	5.15
BROMOMETHANE	CH3BR	LT 280.00	LT 280.00	LT 14.00
CHLOROMETHANE	CH3CL	LT 24.00	LT 24.00	LT 1.20
BROMOFORM	CHBR3	LT 220.00	LT 220.00	LT 11.00
CHLOROFORM	CHCL3	104.00	LT 20.00	LT 1.00
HEXACHLOROCYCLOPENTADIENE (HCCPD)	CL6CP	LT 54.00	LT 54.00	LT 54.00
CHLOROBENZENE	CLC6H5	LT 20.00	LT 20.00	LT 1.00
CHLORDANE	CLDAN	LT 37.00	LT 37.00	LT 37.00
P-CHLOROPHENYLMETHYL SULFIDE	CPHS	LT 10.00	LT 10.00	LT 10.00

ROCKY MOUNTAIN ARSENAL
SOUTH PLANTS WASTEWATER TREATMENT SYSTEM
GC/MS ANALYTICAL DATA

LABORATORY: DATACHEM
SAMPLE DATE: 05/31/89
UNIT OF MEASURE: UGL

ANALYTE	CODE		PSIFIN		PSAAEF		PSASEF
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P-CHLOROPHENYLMETHYL SULFOXIDE	CPMSO	LT	15.00	LT	15.00	LT	15.00
P-CHLOROPHENYLMETHYL SULFONE	CPMSO2		15.10	LT	5.30	LT	5.30
DIBROMOCHLOROPROPANE	DBCP	LT	12.00	LT	12.00	LT	12.00
DIBROMOCHLOROMETHANE	DBRCLM	LT	20.00	LT	20.00	LT	1.00
DICHLOROBENZENE	DCLB	LT	40.00	LT	40.00	LT	2.00
DICYCLOPENTADIENE	DCPD	LT	5.50	LT	5.50	LT	5.50
VAPONA	DOVP	LT	8.50	LT	8.50	LT	8.50
DIISOPROPYLMETHYLPHOSPHONATE	DIMP	LT	21.00	LT	21.00	LT	21.00
DITHIANE	DITH	LT	3.30	LT	3.30	LT	3.30
DIELDRIN	DLDRM	LT	26.00	LT	26.00	LT	26.00
DIMETHYLMETHYLPHOSPHATE	DMMP	LT	130.00	LT	130.00	LT	130.00
ENDRIN	ENDRM	LT	18.00	LT	18.00	LT	18.00
ETHYLBENZENE	ETC6H5	LT	20.00	LT	20.00	LT	1.00
ISODRIN	ISODR	LT	7.80	LT	7.80	LT	7.80
TOLUENE	MEC6H5	LT	20.00	LT	20.00	LT	1.00
METHYLETHYLKETONE	MEK	LT	200.00	LT	200.00	LT	10.00
METHYLISOBUTYLKETONE	MIBK	LT	28.00	LT	28.00	LT	1.40
MALATHION	MLTHN	LT	21.00	LT	21.00	LT	21.00
1,4-OXATHIANE	OXAT	LT	27.00	LT	27.00	LT	27.00
PENTACHLOROPHENOL	PCP	LT	9.10	LT	9.10	LT	9.10
PHENOL	PHENOL		79.80	LT	2.20	LT	2.20
2,2-BIS(PARA-CHLOROPHENYL)-1,1-DICHLOROETHENE	PPDDE	LT	14.00	LT	14.00	LT	14.00
2,2-BIS(PARA-CHLOROPHENYL)1,1,1-TRICHLOROETHANE	PPDDT	LT	18.00	LT	18.00	LT	18.00
PARATHION	PRTHN	LT	37.00	LT	37.00	LT	37.00
SUPONA	SUPONA	LT	19.00	LT	19.00	LT	19.00
1,1,2,2-TETRACHLOROETHANE	TCLEA	LT	30.00	LT	30.00	LT	1.50
TETRACHLOROETHYLENE	TCLEE	LT	20.00	LT	20.00	LT	1.00
TRICHLOROETHYLENE	TRCLE	LT	20.00	LT	20.00	LT	1.00
XYLENES	XYLEN	LT	40.00	LT	40.00	LT	2.00

..... INDICATES THAT ANALYSIS WAS NOT PERFORMED

ROCKY MOUNTAIN ARSENAL
SOUTH PLANTS WASTEWATER TREATMENT SYSTEM
GC/MS ANALYTICAL DATA

LABORATORY: DATACHEM
SAMPLE DATE: 06/27/89
UNIT OF MEASURE: UGL

ANALYTE	CODE	PSIFIN	PSAAEF	PSASEF
1,1,1-TRICHLOROETHANE	111TCE	LT 10.00	LT 10.00	LT 1.00
1,1,2-TRICHLOROETHANE	112TCE	LT 10.00	LT 10.00	LT 1.00
1,1-DICHLOROETHYLENE	110CE	LT 10.00	LT 10.00	LT 1.00
1,1-DICHLOROETHANE	110CLE	LT 10.00	LT 10.00	LT 1.00
1,2-DICHLOROETHYLENE	120CE	LT 50.00	LT 50.00	LT 5.00
1,2-DICHLOROETHANE	120CLE	LT 10.00	LT 10.00	LT 1.00
1,2-DICHLOROPROPANE	120CLP	LT 10.00	LT 10.00	LT 1.00
1,3-DICHLOROBENZENE	130CLB	LT 10.00	LT 10.00	LT 1.00
1,3-DICHLOROPROPANE	130CP	LT 48.00	LT 48.00	LT 4.80
M-XYLENE	130MB	LT 10.00	LT 10.00	LT 1.00
2,3,6-TRICHLOROPHENOL	236TCP	LT 1.70	LT 1.70	LT 1.70
2,4,5-TRICHLOROPHENOL	245TCP	LT 2.80	LT 2.80	LT 2.80
2,4,6-TRICHLOROPHENOL	246TCP	LT 3.60	LT 3.60	LT 3.60
2,4-DICHLOROPHENOL	240CLP	LT 8.40	LT 8.40	LT 8.40
2,4-DIMETHYLPHENOL	240MPN	LT 4.40	LT 4.40	LT 4.40
2,4-DINITROPHENOL	240NP	LT 176.00	LT 176.00	LT 176.00
2-CHLOROETHYL VINYL ETHER	2CLEVE	LT 35.00	LT 35.00	LT 3.50
2-CHLOROPHENOL	2CLP	LT 2.80	LT 2.80	LT 2.80
2-METHYLPHENOL	2MP	LT 3.60	LT 3.60	LT 3.60
2-NITROPHENOL	2NP	LT 8.20	LT 8.20	LT 8.20
3-METHYL-4-CHLOROPHENOL	4CL3C	LT 8.50	LT 8.50	LT 8.50
4-METHYLPHENOL	4MP	LT 13.70	LT 2.80	LT 2.80
4-NITROPHENOL	4NP	LT 96.00	LT 96.00	LT 96.00
ACETONE	ACET	2,350.00	LT 2,020.00	LT 8.00
ACRYLONITRILE	ACRYLO	LT 84.00	LT 84.00	LT 8.40
ALDRIN	ALDRN	LT 13.00	LT 13.00	LT 13.00
ATRAZINE	ATZ	LT 5.90	LT 5.90	LT 5.90
BROMODICHLOROMETHANE	BRDCLM	LT 10.00	LT 10.00	LT 1.00
CHLOROETHENE	C2H3CL	LT 120.00	LT 120.00	LT 12.00
CHLOROETHANE	C2H5CL	LT 80.00	LT 80.00	LT 8.00
BENZENE	C6H6	LT 35.70	LT 10.00	LT 1.00
TRICHLOROFLUOROMETHANE	CCL3F	LT 10.00	LT 10.00	LT 1.00
CARBON TETRACHLORIDE	CCL4	LT 10.00	LT 10.00	LT 1.00
METHYLENE CHLORIDE	CH2CL2	LT 10.00	LT 10.00	LT 1.00
BROMOMETHANE	CH3BR	LT 140.00	LT 140.00	LT 14.00
CHLOROMETHANE	CH3CL	LT 12.00	LT 12.00	LT 1.20
BROMOFORM	CHBR3	LT 110.00	LT 110.00	LT 11.00
CHLOROFORM	CHCL3	LT 46.00	LT 10.00	LT 1.00
HEXACHLOROCYCLOPENTADIENE (HCCPD)	CL6CP	LT 54.00	LT 54.00	LT 54.00
CHLOROBENZENE	CLC6H5	LT 10.00	LT 10.00	LT 1.00
CHLORDANE	CLDAN	LT 37.00	LT 37.00	LT 37.00
P-CHLOROPHENYLMETHYL SULFIDE	CPMS	LT 10.00	LT 10.00	LT 10.00

ROCKY MOUNTAIN ARSENAL
SOUTH PLANTS WASTEWATER TREATMENT SYSTEM
GC/MS ANALYTICAL DATA

LABORATORY: DATACHEM
SAMPLE DATE: 06/27/89
UNIT OF MEASURE: UGL

ANALYTE	CODE	PSIFIN	PSAAEF	PSASEF
P-CHLOROPHENYLMETHYL SULFOXIDE	CPMSO	LT 15.00	LT 15.00	LT 15.00
P-CHLOROPHENYLMETHYL SULFONE	CPMSO2	10.20	LT 5.30	LT 5.30
DIBROMOCHLOROPROPANE	DBCP	LT 12.00	LT 12.00	LT 12.00
DIBROMOCHLOROMETHANE	DBRCLM	LT 10.00	LT 10.00	LT 1.00
DICHLOROBENZENE	DCLB	LT 20.00	LT 20.00	LT 2.00
DICYCLOPENTADIENE	DCPD	LT 5.50	LT 5.50	LT 5.50
VAPONA	DCVP	LT 8.50	LT 8.50	LT 8.50
DIISOPROPYLMETHYLPHOSPHONATE	DIMP	30.20	LT 21.00	LT 21.00
DITHIAME	DITH	LT 3.30	LT 3.30	LT 3.30
DIELDRIN	DLDRN	LT 26.00	LT 26.00	LT 26.00
DIMETHYLMETHYLPHOSPHATE	DMMP	LT 130.00	LT 130.00	LT 130.00
ENDRIN	ENDRN	LT 18.00	LT 18.00	LT 18.00
ETHYLBENZENE	ETC6H5	LT 10.00	LT 10.00	LT 1.00
ISODRIN	ISODR	LT 7.80	LT 7.80	LT 7.80
TOLUENE	MEC6H5	LT 10.00	LT 10.00	LT 1.00
METHYLETHYLKETONE	MEK	LT 100.00	LT 100.00	LT 10.00
METHYLSOBUTYLKETONE	MIBK	LT 14.00	LT 14.00	LT 1.40
MALATHION	MLTHN	LT 21.00	LT 21.00	LT 21.00
1,4-OXATHIANE	OXAT	LT 27.00	LT 27.00	LT 27.00
PENTACHLOROPHENOL	PCP	LT 9.10	LT 9.10	LT 9.10
PHENOL	PHENOL	34.90	LT 2.20	LT 2.20
2,2-BIS(PARA-CHLOROPHENYL)-1,1-DICHLOROETHENE	PPDE	LT 14.00	LT 14.00	LT 14.00
2,2-BIS(PARA-CHLOROPHENYL)1,1,1-TRICHLOROETHANE	PPDT	LT 18.00	LT 18.00	LT 18.00
PARATHION	PRTHN	LT 37.00	LT 37.00	LT 37.00
SUPONA	SUPONA	LT 19.00	LT 19.00	LT 19.00
1,1,2,2-TETRACHLOROETHANE	TCLEA	LT 15.00	LT 15.00	LT 1.50
TETRACHLOROETHYLENE	TCLEE	LT 10.00	LT 10.00	LT 1.00
TRICHLOROETHYLENE	TRCLE	LT 10.00	LT 10.00	LT 1.00
XYLENES	XYLEM	LT 20.00	LT 20.00	LT 2.00

..... INDICATES THAT ANALYSIS WAS NOT PERFORMED

ROCKY MOUNTAIN ARSENAL
SOUTH PLANTS WASTEWATER TREATMENT SYSTEM
GC/MS ANALYTICAL DATA

LABORATORY: DATACHEN
SAMPLE DATE: 07/25/89
UNIT OF MEASURE: UGL

ANALYTE	CODE	PSIFIN	PSAAEF	PSASEF
1,1,1-TRICHLOROETHANE	111TCE	LT 10.00	LT 1.00	LT 1.00
1,1,2-TRICHLOROETHANE	112TCE	LT 10.00	LT 1.00	LT 1.00
1,1-DICHLOROETHYLENE	11DCE	LT 10.00	LT 1.00	LT 1.00
1,1-DICHLOROETHANE	11DCLE	LT 10.00	LT 1.00	LT 1.00
1,2-DICHLOROETHYLENE	12DCE	LT 50.00	LT 5.00	LT 5.00
1,2-DICHLOROETHANE	12DCLE	LT 10.00	LT 1.00	LT 1.00
1,2-DICHLOROPROPANE	12DCLP	LT 10.00	LT 1.00	LT 1.00
1,3-DICHLOROBENZENE	13DCLB	LT 10.00	LT 1.00	LT 1.00
1,3-DICHLOROPROPANE	13DCP	LT 48.00	LT 4.80	LT 4.80
M-XYLENE	13DMB	LT 10.00	LT 1.00	LT 1.00
2,3,6-TRICHLOROPHENOL	236TCP	LT 1.70	LT 1.70	LT 1.70
2,4,5-TRICHLOROPHENOL	245TCP	LT 2.80	LT 2.80	LT 2.80
2,4,6-TRICHLOROPHENOL	246TCP	LT 3.60	LT 3.60	LT 3.60
2,4-DICHLOROPHENOL	24DCLP	LT 8.40	LT 8.40	LT 8.40
2,4-DIMETHYLPHENOL	24DMPN	4.51	LT 4.40	LT 4.40
2,4-DINITROPHENOL	24DNP	LT 176.00	LT 176.00	LT 176.00
2-CHLOROETHYL VINYL ETHER	2CLEVE	LT 35.00	LT 3.50	LT 3.50
2-CHLOROPHENOL	2CLP	LT 2.80	LT 2.80	LT 2.80
2-METHYLPHENOL	2MP	LT 3.60	LT 3.60	LT 3.60
2-NITROPHENOL	2NP	LT 8.20	LT 8.20	LT 8.20
3-METHYL-4-CHLOROPHENOL	4CL3C	LT 6.50	LT 8.50	LT 8.50
4-METHYLPHENOL	4MP	LT 2.80	LT 2.80	LT 2.80
4-NITROPHENOL	4NP	LT 96.00	LT 96.00	LT 96.00
ACETONE	ACET	2,000.00	LT 8.00	LT 8.00
ACRYLONITRILE	ACRYLO	LT 84.00	LT 8.40	LT 8.40
ALDRIN	ALDRN	LT 13.00	LT 13.00	LT 13.00
ATRAZINE	ATZ	LT 5.90	LT 5.90	LT 5.90
BROMODICHLOROMETHANE	BRDCLM	LT 10.00	LT 1.00	LT 1.00
CHLOROETHENE	C2H3CL	LT 120.00	LT 12.00	LT 12.00
CHLOROETHANE	C2H5CL	LT 80.00	LT 8.00	LT 8.00
BENZENE	C6H6	10.90	LT 1.00	LT 1.00
TRICHLOROFLUOROMETHANE	CCL3F	LT 10.00	LT 1.00	LT 1.00
CARBON TETRACHLORIDE	CCL4	LT 10.00	LT 1.00	LT 1.00
METHYLENE CHLORIDE	CH2CL2	LT 10.00	LT 1.00	LT 1.00
BROMOMETHANE	CH3BR	LT 140.00	LT 14.00	LT 14.00
CHLOROMETHANE	CH3CL	LT 12.00	LT 1.20	LT 1.20
BROMOFORM	CHBR3	LT 110.00	LT 11.00	LT 11.00
CHLOROFORM	CHCL3	19.00	LT 3.10	LT 1.00
HEXACHLOROCYCLOPENTADIENE (HCCPD)	CL6CP	LT 54.00	LT 54.00	LT 54.00
CHLOROBENZENE	CLC6H5	LT 10.00	LT 1.00	LT 1.00
CHLORDANE	CLDAN	LT 37.00	LT 37.00	LT 37.00
P-CHLOROPHENYLMETHYL SULFIDE	CPMS	LT 10.00	LT 10.00	LT 10.00

ROCKY MOUNTAIN ARSENAL
SOUTH PLANTS WASTEWATER TREATMENT SYSTEM
GC/MS ANALYTICAL DATA

LABORATORY: DATACHEN
SAMPLE DATE: 07/25/89
UNIT OF MEASURE: UGL

ANALYTE	CODE	PSIFIN	PSAAEF	PSASEF
P-CHLOROPHENYLMETHYL SULFOXIDE	CPMSO	LT 15.00	LT 15.00	LT 15.00
P-CHLOROPHENYLMETHYL SULFONE	CPMSO2	9.31	LT 5.30	LT 5.30
DIBROMOCHLOROPROPANE	DBCP	LT 12.00	LT 12.00	LT 12.00
DIBROMOCHLOROMETHANE	DBRCLM	LT 10.00	LT 1.00	LT 1.00
DICHLOROBENZENE	DCLB	LT 20.00	LT	LT 2.00
DICYCLOPENTADIENE	DCPD	LT 5.50	LT 5.50	LT 5.50
VAPONA	DDVP	LT 8.50	LT 8.50	LT 8.50
DIISOPROPYLMETHYLPHOSPHONATE	DIMP	42.50	LT 21.00	LT 21.00
DITHIANE	DITH	LT 3.30	LT 3.30	LT 3.30
DIELDRIN	DLDRN	LT 26.00	LT 26.00	LT 26.00
DIMETHYLMETHYLPHOSPHATE	DMMP	LT 130.00	LT 130.00	LT 130.00
ENDRIN	ENDRN	LT 18.00	LT 18.00	LT 18.00
ETHYLBENZENE	ETC6H5	LT 10.00	LT 1.00	LT 1.00
ISODRIN	ISODR	LT 7.80	LT 7.80	LT 7.80
TOLUENE	MEC6H5	LT 10.00	LT 1.00	LT 1.00
METHYLETHYLKETONE	MEK	LT 100.00	LT 10.00	LT 10.00
METHYLISOBUTYLKETONE	MIBK	LT 14.00	LT 1.40	LT 1.40
MALATHION	MLTHN	LT 21.00	LT 21.00	LT 21.00
1,4-OXATHIANE	OXAT	LT 27.00	LT 27.00	LT 27.00
PENTACHLOROPHENOL	PCP	LT 9.10	LT 9.10	LT 9.10
PHENOL	PHENOL	LT 2.20	LT 2.20	LT 2.20
2,2-BIS(PARA-CHLOROPHENYL)-1,1-DICHLOROETHENE	PPDE	LT 14.00	LT 14.00	LT 14.00
2,2-BIS(PARA-CHLOROPHENYL)1,1,1-TRICHLOROETHANE	PPDT	LT 18.00	LT 18.00	LT 18.00
PARATHION	PRTHN	LT 37.00	LT 37.00	LT 37.00
SUPONA	SUPONA	LT 19.00	LT 19.00	LT 19.00
1,1,2,2-TETRACHLOROETHANE	TCLEA	LT 15.00	LT 1.50	LT 1.50
TETRACHLOROETHYLENE	TCLEE	LT 10.00	LT 1.00	LT 1.00
TRICHLOROETHYLENE	TRCLE	LT 10.00	LT 1.00	LT 1.00
XYLENES	XYLEN	LT 20.00	LT 2.00	LT 2.00

..... INDICATES THAT ANALYSIS WAS NOT PERFORMED

ROCKY MOUNTAIN ARSENAL
SOUTH PLANTS WASTEWATER TREATMENT SYSTEM
GC/MS ANALYTICAL DATA

LABORATORY: DATACHEM
SAMPLE DATE: 08/30/89
UNIT OF MEASURE: UGL

ANALYTE	CODE	PSIFIN	PSAAEF	PSASEF
2,3,6-TRICHLOROPHENOL	236TCP	LT 1.70	LT 1.70	LT 1.70
2,4,5-TRICHLOROPHENOL	245TCP	LT 2.80	LT 2.80	LT 2.80
2,4,6-TRICHLOROPHENOL	246TCP	LT 3.60	LT 3.60	LT 3.60
2,4-DICHLOROPHENOL	240CLP	LT 8.40	LT 8.40	LT 8.40
2,4-DIMETHYLPHENOL	240MPN	LT 4.40	LT 4.40	LT 4.40
2,4-DINITROPHENOL	240NP	LT 176.00	LT 176.00	LT 176.00
2-CHLOROPHENOL	2CLP	LT 2.80	LT 2.80	LT 2.80
2-METHYLPHENOL	2MP	LT 3.60	LT 3.60	LT 3.60
2-NITROPHENOL	2NP	LT 8.20	LT 8.20	LT 8.20
3-METHYL-4-CHLOROPHENOL	4CL3C	LT 8.50	LT 8.50	LT 8.50
4-METHYLPHENOL	4MP	LT 2.80	LT 2.80	LT 2.80
4-NITROPHENOL	4NP	LT 96.00	LT 96.00	LT 96.00
ALDRIN	ALDRN	LT 13.00	LT 13.00	LT 13.00
ATRAZINE	ATZ	LT 5.90	LT 5.90	LT 5.90
HEXACHLOROCYCLOPENTADIENE (HCCPD)	CL6CP	LT 54.00	LT 54.00	LT 54.00
CHLORDANE	CLDAN	LT 37.00	LT 37.00	LT 37.00
P-CHLOROPHENYLMETHYL SULFIDE	CPMS	LT 10.00	LT 10.00	LT 10.00
P-CHLOROPHENYLMETHYL SULFOXIDE	CPMSO	LT 15.00	LT 15.00	LT 15.00
P-CHLOROPHENYLMETHYL SULFONE	CPMSO2	LT 11.20	LT 5.30	LT 5.30
DIBROMOCHLOROPROPANE	DBCP	LT 12.00	LT 12.00	LT 12.00
DICYCLOPENTADIENE	DCPD	LT 5.50	LT 5.50	LT 5.50
VAPONA	DDVP	LT 8.50	LT 8.50	LT 8.50
DIISOPROPYLMETHYLPHOSPHONATE	DIMP	52.80	LT 21.00	LT 21.00
DITHIANE	DITH	LT 3.30	LT 3.30	LT 3.30
DIELDRIN	DLDRN	LT 26.00	LT 26.00	LT 26.00
DIMETHYLMETHYLPHOSPHATE	DMMP	LT 130.00	LT 130.00	LT 130.00
ENDRIN	ENDRN	LT 18.00	LT 18.00	LT 18.00
ISODRIN	ISODR	LT 7.80	LT 7.80	LT 7.80
MALATHION	MLTHN	LT 21.00	LT 21.00	LT 21.00
1,4-OXATHIANE	OXAT	LT 27.00	LT 27.00	LT 27.00
PENTACHLOROPHENOL	PCP	LT 9.10	LT 9.10	LT 9.10
PHENOL	PHENOL	LT 2.20	LT 2.20	LT 2.20
2,2-BIS(PARA-CHLOROPHENYL)-1,1-DICHLOROETHENE	PPDE	LT 14.00	LT 14.00	LT 14.00
2,2-BIS(PARA-CHLOROPHENYL)1,1,1-TRICHLOROETHANE	PPDOT	LT 18.00	LT 18.00	LT 18.00
PARATHION	PRTHN	LT 37.00	LT 37.00	LT 37.00
SUPONA	SUPONA	LT 19.00	LT 19.00	LT 19.00

..... INDICATES THAT ANALYSIS WAS NOT PERFORMED

ROCKY MOUNTAIN ARSENAL
SOUTH PLANTS WASTEWATER TREATMENT SYSTEM
GC/MS ANALYTICAL DATA

LABORATORY: DATACHEN
SAMPLE DATE: 09/27/89
UNIT OF MEASURE: UGL

ANALYTE	CODE	PSIFIN	PSAAEF	PSASEF
2,3,6-TRICHLOROPHENOL	236TCP	LT 1.70	LT 1.70	LT 1.70
2,4,5-TRICHLOROPHENOL	245TCP	LT 2.80	LT 2.80	LT 2.80
2,4,6-TRICHLOROPHENOL	246TCP	LT 3.60	LT 3.60	LT 3.60
2,4-DICHLOROPHENOL	24DCLP	LT 8.40	LT 8.40	LT 8.40
2,4-DIMETHYLPHENOL	24DMPN	LT 4.40	LT 4.40	LT 4.40
2,4-DINITROPHENOL	24DNP	LT 176.00	LT 176.00	LT 176.00
2-CHLOROPHENOL	2CLP	LT 2.80	LT 2.80	LT 2.80
2-METHYLPHENOL	2MP	LT 3.60	LT 3.60	LT 3.60
2-NITROPHENOL	2NP	LT 8.20	LT 8.20	LT 8.20
3-METHYL-4-CHLOROPHENOL	4CL3C	LT 8.50	LT 8.50	LT 8.50
4-METHYLPHENOL	4MP	LT 2.80	LT 2.80	LT 2.80
4-NITROPHENOL	4NP	LT 96.00	LT 96.00	LT 96.00
ALDRIN	ALDRN	LT 13.00	LT 13.00	LT 13.00
ATRAZINE	ATZ	LT 5.90	LT 5.90	LT 5.90
HEXACHLOROCYCLOPENTADIENE (HCCPD)	CL6CP	LT 54.00	LT 54.00	LT 54.00
CHLORDANE	CLDAN	LT 37.00	LT 37.00	LT 37.00
P-CHLOROPHENYLMETHYL SULFIDE	CPMS	LT 10.00	LT 10.00	LT 10.00
P-CHLOROPHENYLMETHYL SULFOXIDE	CPMSO	LT 15.00	LT 15.00	LT 15.00
P-CHLOROPHENYLMETHYL SULFONE	CPMSO2	LT 5.30	LT 5.30	LT 5.30
DIBROMOCHLOROPROPANE	DBCP	LT 12.00	LT 12.00	LT 12.00
DICYCLOPENTADIENE	DCPD	LT 5.50	LT 5.50	LT 5.50
VAPONA	DDVP	LT 8.50	LT 8.50	LT 8.50
DIISOPROPYLMETHYLPHOSPHONATE	DIMP	LT 21.00	LT 21.00	LT 21.00
DITHIANE	DITH	LT 3.30	LT 3.30	LT 3.30
DIELDRIN	DLDRN	LT 26.00	LT 26.00	LT 26.00
DIMETHYLMETHYLPHOSPHATE	DMMP	LT 130.00	LT 130.00	LT 130.00
ENDRIN	ENDRN	LT 18.00	LT 18.00	LT 18.00
ISODRIN	ISODR	LT 7.80	LT 7.80	LT 7.80
MALATHION	MLTHN	LT 21.00	LT 21.00	LT 21.00
1,4-OXATHIANE	OXAT	LT 27.00	LT 27.00	LT 27.00
PENTACHLOROPHENOL	PCP	LT 9.10	LT 9.10	LT 9.10
PHENOL	PHENOL	LT 2.20	LT 2.20	LT 2.20
2,2-BIS(PARA-CHLOROPHENYL)-1,1-DICHLOROETHENE	PPDE	LT 14.00	LT 14.00	LT 14.00
2,2-BIS(PARA-CHLOROPHENYL)1,1,1-TRICHLOROETHANE	PPDT	LT 18.00	LT 18.00	LT 18.00
PARATHION	PRTHN	LT 37.00	LT 37.00	LT 37.00
SUPONA	SUPONA	LT 19.00	LT 19.00	LT 19.00

..... INDICATES THAT ANALYSIS WAS NOT PERFORMED